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HEBREW CODICOLOGY

Historical and Comparative Typology of Hebrew Medieval Codices based on the Documentation of the Extant Dated Manuscripts Using a Quantitative Approach

Preprint internet English version 0.4 (February 2020)

To be published by the Israel Academy of Sciences and Humanities

Masoretic notes in Prophets. MS Cairo, the Karaite Synagogue. The earliest dated colophon of extant Hebrew codex. According to the colophon the manuscript was written by Moshe ben Asher in Tiberius (Palestine) in 894/5, but in fact about 1000.

English version by Ilana Goldberg

Revision of translation and scientific editing Nurit Pasternak

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MS = Manuscript

The notations for the manuscripts are comprised of the abbreviation MS followed by the place-name of the library where they are kept, the name of the library or institution housing the manuscript, and its call mark in that collection. Manuscripts kept in large collections are referred only by their place-name without the name of the library. The following are the place-names and libraries or institutions, or their abbreviations as employed in the manuscript references:

Amsterdam, UBA = Universiteitbibliotheek, Rosenthaliana

Arras, Bibliothèque municipale

Berlin = Staatsbibliothek zu Berlin (Preussischer Kulturbesitz)

Bern, BB = Burgerbibliothek

Bologna, BU = Biblioteca Universitaria

Breslau, Seminar = Jüdisch-theologisches Seminar in Breslau

Budapest, MTA = Magyar Tudományos Akadémia, Könyvtàr (Library of the Hungarian Academy of Sciences)

Cambridge, St John's College = St John's College

Cambridge, Trinity College = Trinity College

Cambridge = University Library

Cincinnati, HUC = Hebrew Union College

Copenhagen, Royal Library = Det Kongelige bibliotek

Dresden, Landesbib. = Sächsische Landesbibliothek

Florence, Bib. Nazionale = Biblioteca Nazionale Centrale

Florence, Bib. Laurenziana = Biblioteca Medicea Laurenziana

Frankfurt am Main, UB = Universitätsbibliothek Johann Christian Senckenberg

Hamburg, = Staats- und Universitätsbibliothek

Karlsruhe, Badische Landesbibliothek

Jerusalem = The National Library of Israel (formerly: The Jewish National and University Library)

Leiden, University = Universiteitsbibliothek

Leipzig, UB = Universitätsbibliothek

Lisbon, Bib. Nacional = Biblioteca Nacional de Portugal

Livorno, Talmud Tora = Biblioteca del Talmud Tora

London = British Library

London, Beth Din = Beth Din and Beth Hamidrash Library. The manuscript collection was offered for sale at Christie's Auction House in 1999.

London, Jews' College = Jews' College (now London School of Jewish Studies). Part of the library's collection has been sold by Christie in 1999; the Montefiore collection, which had been deposited in this library, was returned to the trustees of the collection in 2001 and sold in 2004.

London, Valmadonna = Valmadonna Trust Library

The manuscript collection was sold by Sotheby's in 2016 and 2017.

Madrid, Complutense = Biblioteca de la Universitad Complutenlse

Mantua, CI = Comunità Israelitica (kept in Biblioteca Comunale)

Milano, BA = Biblioteca Ambrosiana

Moscow, RSL = Russian State Library, Guenzburg Collection

Munich = Bayerische Staasbibliothek

New York, Columbia = Columbia University

New York = Jewish Theological Seminary of America

Oxford = Bodleian Library

Oxford, CCC = Corpus Christi College

Paris, AIU = Alliance israélite universelle

Paris, Bibliothèque Mazarine

Paris = Bibliothèque nationale de France

Parma = Biblioteca Palatina

Prague, NL = National Library

Rome, Bib. Angelica = Biblioteca Angelica

Rome, Bib. Casanatense = Biblioteca Casanatense

Rome, Vittorio Emanuele = Biblioteca Nazionale Centrale Vittorio Emanuele II

Rovigo, Accademia = Biblioteca dell'Accademia Concordi

San Francisco, Sutro = Sutro State Library

San Lorenzo de El Escorial = Biblioteca Real

Sassoon (private), formerly kept in Letchworth, England, a considerable part of the large collection has been sold in auctions

St. Petersburg = St. Petersburg, National Library of Russia

St. Petersburg, Oriental Institute = Oriental Institute of the Russian Academy of Sciences

Strasbourg, BNU = Bibliothèque nationale et universitaire

Toledo, Cathedral = Archivo y Biblioteca Capitulares

Tübingen, UB = Universitätsbibliothek

Vatican = Biblioteca Apostolica Vaticana

Venice, Bib. Marciana = Biblioteca Nazionale Marciana

Vienna, ÖNB = Österreichische Nationalbibliothek

Vienna, IK = Israelitische Kultursgemeinde

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Special Notations

[   ] probable reading

^   ^ interlinear addition

{   } erasure

[[   ]] lacuna

< > completion, insertion of an explanation or comment, or ellipsis within a quote <…>

Preface

This book is the product of my sixty-year long fascination with the study of Hebrew manuscripts. The surviving Medieval codices – the most important foundation for the investigation of various genres and strata of Jewish literature which had been created and transmitted in Hebrew or in Hebrew script for some 1500 years, until the spread of the Hebrew printing during the sixteenth century – captivated me from the moment I became aware of their existence during my first year as a university undergraduate. The thrill of this encounter derived not only from the diverse texts that were communicated in this medium, but especially from the direct and sensuous contact with concrete historical and literary testimonies and with the process of the transmission and reception of these texts. My involvement with these palpable artefacts brought to life the Jewish societies that initiated the production of books and consumed them. Moreover, they drew me into close intimacy with the makers of these books and made me grow fond of their complex craft, skill, and art. This immediate contact blurred time spans, bridging the gap between an unknown past and the researcher in quest of its hidden material, social, mental, and spiritual treasures, and filled me with an intoxicating sense of historical continuity.

The goals of this book were several. The first was to establish a diachronic typology of the Medieval book in Hebrew script as a field of historical inquiry in its own right, using the method of quantitative codicology. This was to be achieved on the basis of a detailed documentation of all the extant dated Hebrew manuscripts and their comparison to manuscripts in other scripts produced in the same areas. The second goal was to present the historical and social implications of this typology. The third was to provide the many scholars and students who use manuscript sources or prepare critical editions of Medieval texts with a tool or a guide that would enable them to identify the provenance of a manuscript and to estimate the time of its copying, as well as make them acquainted with the manifold scribal practices in the various zones, and, indeed, for the purposes of textual criticism and the understanding of text transmission. The fourth goal was to emphasise the importance and indispensability of a material examination of the codices when dealing with texts and their transmission and with

editorial procedures. Above all, I have sought to demonstrate the need to regard handwritten books not only as receptacles of texts, but also as cultural artefacts replete with information without which Jewish Medieval history would remain impoverished. In their production practices, design and the various records of owners and users over the time these tens of thousands of objects handed down are per se authentic historical sources that shed light upon the societies that made them. Classifying manuscripts according to provenance and time of production should enrich historical research with most reliable data about the intellectual character and activity of Jewish diasporic Medieval communities, and may even provide evidence about their sizes. The identification of the Byzantine type of script, for example, reveals that thousands of manuscripts were produced in the Byzantine zone from the thirteenth century onwards, reflecting the spiritual quality and level of literacy of Jewish communities in Greece, western Asia Minor, and the Balkans, about which there is hardly any information from other sources. The colophons of the Byzantine codices that state the date and place of copying, like colophons from other zones, are sometimes the only source of information about Jewish communities in those places. The comparison of the distribution of topics in the dated Byzantine manuscripts with their distribution in manuscripts produced elsewhere is both unexpected and instructive: the proportion of scientific manuscripts as well as of philosophical and kabbalistic manuscripts are the highest in this corpus, and together they comprise nearly half of all the manuscripts copied in the Byzantine zone. Classification according to type of script of the dated manuscripts copied in Italy has produced surprising data about the proportions of manuscripts in Sefardic scripts copied by immigrants from Spain and Provence and that of manuscripts in Ashkenazic scripts produced by immigrants from the German lands in Italy. I have tried to the best of my ability to disseminate this awareness and its implications for the study of cultural and social history in Jewish studies, admittedly not always with success. However, it appears that of late, Medieval Jewish studies have been showing an increasing appreciation of the approach suggested here, and its applications are growing in numbers.

Some five decades ago, I published, at the suggestion of my colleague and research partner Colette Sirat, a short work entitled *Hebrew Codicology: Tentative Typology of Technical Practices Employed in Hebrew Dated Medieval Manuscripts*, Paris, Institut

de Recherche et d'Histoire des Textes, 1977. Despite the provisory status of this typology of medieval Hebrew bookcraft, as pointed out in the work's subtitle, it met with great demand, being the first attempt to establish a diachronic and synchronic typology of a selection of codicological characteristics of Hebrew manuscripts; moreover, it attempted to base this typology on quantitative methodology and on the documentation of manuscripts that included both the date and the place of production. It is no wonder, therefore, that four years later a revised version of this modest publication was reprinted by the Israel Academy of Sciences and Humanities (Jerusalem 1981). The work dealt with the main codicological characteristics of several hundred medieval dated manuscripts, documented in their respective libraries, as part of the Hebrew Palaeography Project under my direction. This project was sponsored by the Israel Academy of Sciences and Humanities with the participation of the Jewish National and University Library, and the close collaboration with a parallel project headed by Colette Sirat, under the auspices of the Institut de Recherche et d'Histoire des Textes in Paris, which is part of France's Centre National de la Recherche Scientifique. In the years since the publication of this tentative typology, the Hebrew Palaeography Project has thoroughly documented nearly all the accessible dated extant manuscripts worldwide in addition to many undated codices in which the name of the copyist was nonetheless stated or had been identified. Moreover, the tens of thousands of codicological, textual, graphic, and numerical data collected from the manuscripts *in situ* were encoded and processed at the Hebrew Palaeography Project in Jerusalem in an electronic database entitled SfarData, developed and expanded continuously over the years by Eylon Meroz and the software team of Meroz Systems, in accordance with the requirements of our research. A sophisticated data retrieval system has been especially designed and developed, allowing an unlimited number of classificatory searches, the retrieval of combined variables, cross-searches, and complex statistical and graphic processing, as well as the integration of different data types – encoded, alphabetic, numerical, and image data. The comprehensive documentation, on the one hand, and the search, classification, and data processing tool on the other, both enable and justify an exhaustive and final (for the moment) presentation of a typology of the material, technical, technological, and graphical characteristics of handwritten medieval codices in Hebrew script; this according to their types and geocultural regions, and based on the investigation of the vast majority of the extant dated manuscripts, half

of which also include their place of production. The electronic database that serves as the foundation for this book has also expedited the decision to publish the work electronically prior to printing. In addition to the desire to make this guide for Hebrew manuscripts accessible, the electronic version allows links to the illustrations included in SfarData to be presented, unlimitedly, for easy and quick access; moreover, it allows a continuous updating of the data. Furthermore, the historical typology presented in the electronic edition is integrated within the SfarData website, accessible to the public on the website of the National Library of Israel. The typology has thus been transformed from a merely historical and comparative study to a useful codicological handbook open to the public desiring to study or consult Hebrew manuscripts. It includes general overviews and explanations of the technical components of codex production in general and of the production of the Hebrew codex in particular, and serves as an instructive introduction to readers who wish to make use of the SfarData database and exploit the vast information it contains.

The need to devote a comprehensive work to the typology of the medieval Hebrew codex in its various regions and transformations stemmed not only from the significant developments in the field of Hebrew codicology and from the understandable desire to sum up five decades of detailed and systematic field research, but also from the growing interest in the material aspects of the text (nowadays frequently designated in English as 'material text'), and from the growing awareness of its importance in textual research. The very act of assembling microfilm copies of nearly all of the extant Hebrew manuscripts and fragments, identifying and cataloguing them – the extraordinary achievement of the Institute of Microfilmed Hebrew Manuscripts in the Jewish National and University Library (nowadays the National Library of Israel) in Jerusalem – has considerably accelerated the use of medieval manuscripts for the purpose of textual research and has multiplied by a tremendous factor the number of users, making the current handbook useful and much needed. This scholarly trend is dramatically promoted by the recent advanced technology of digitization of manuscripts that encourages many libraries to make also their Hebrew manuscript collections accessible on their websites, and inspired the National Library of Israel to launch Ktiv – The International Collection of Digitized Hebrew Manuscripts, a joint venture with the Friedberg Jewish Manuscript Society.

This book is, therefore, both an introduction to medieval Hebrew manuscripts and a typological guide to their characteristics, based on the exhaustive examination of almost all the extant Medieval manuscripts dated up to 1540, as well as manuscripts whose copyists were either mentioned or identified, especially those displaying their place of production, in nearly all libraries and collections around the world. This methodological foundation provides us with a most reliable skeletal frame for establishing a typology of the utmost possible validity within the limits of the accidental survival of dated manuscripts, especially if multiple witnesses are available. At the same time, I did not avoid including in this introduction and handbook detailed discussions on specific topics, queries regarding the hypothetical evolution or consolidation of scribal practices that might have existed prior to the earliest extant manuscripts in each region, as well as speculations which concern the history of the production of the Hebrew codex and its development in its various regions. In addition, a considerable, albeit secondary, part of the book, has been devoted to comparisons of regional Hebrew bookcraft practices with parallel practices known from other scripts, especially Latin, Arabic, and Greek, which were common in the areas settled by Jews. Such a comparative approach is a *sine qua non*, given the historical reality of the Jewish dispersed communities and the impact of surrounding cultures on them, notwithstanding their insularity in certain regions.

Several sections of this work have been published in one form or another over the past forty years in journals and in my own books. Most of these have taken on a new guise, all have been updated in accordance with the current database, and they are now presented here in a coherent and systematized form. In fact, this work is the summing up of my investigations in the field of the Hebrew handwritten book production, with which I have been involved since 1965, and includes the evolution of my approach up to its current formulations and conclusions.

I composed the greater part of this book in Oxford, on the basis of documented data, literary sources, and the study of research literature over almost fifty-year period of field research and study. I began to write the book in 2003 as a Fowler Hamilton Visiting Research Fellow at Christ Church, Oxford. I wish to thank the Governing Body of that institution for selecting me as fellow, allowing me to begin writing the book under the most agreeable conditions an author could wish for; this at a university

endowed with a most valuable collection of Hebrew manuscripts and with a rich collection of publications on the study of medieval codices, accessible at Duke Humfrey's reading room in the Bodleian Library. Many of the book's chapters were written while I was residing in the beautiful Yarnton Manor in 2005, as well as in 2007-2012, during the months in which I taught under the auspices of the Hebrew and Jewish Unit of Oxford University, and as a fellow at the Oxford Centre for Hebrew and Jewish Studies. The peaceful rural environment, the loveliness of Yarnton Manor, the welcoming and pleasant atmosphere of the Centre and the services rendered by its employees contributed invaluably to the writing of this book. Very special thanks are due to Piet van Boxel, then academic director of the Centre and Curator of the Hebraica and Judaica collections at the Bodleian Library. Some chapters of the book were written during 2005/6 at the Center for Advanced Judaic Studies at the University of Pennsylvania in Philadelphia, under the direction of David Ruderman. I cannot overstate the value of this centre for scholars in the field of Jewish studies. Its efficient, convenient and gracious assistance to scholarly research and its needs, the infrastructures at the disposal of the fellows, and the multidisciplinary dialogue promoted by the group structure made it a unique setting, unparalleled by any other research centre in the field of Jewish studies.

The Israel Academy of Sciences and Humanities deserves special gratitude for sponsoring the Hebrew Palaeography Project from its inception in 1965, and for fully, then partially, funding its activity for many years. Professor Gershom Scholem, who for many years headed the Academy's steering committee, at the time of the project's creation and until his passing, enthusiastically supported the ambitious project to document all the dated Hebrew manuscripts in order to establish a codicological and palaeographic typology, as presented to him by two young scholars just embarking on their research careers, namely Colette Sirat, who first conceived the idea of documentation, and myself. I feel deep gratitude to Colette Sirat, as well as great esteem, not only for initiating the project, both in Jerusalem and Paris, and the publication of most of its scholarly output, but also for the pleasant and loyal partnership of many years. Establishing the current typology could not have been imaginable without the Hebrew Palaeography Project's doings, namely, the fieldwork consisting of the documentation of all manuscripts that were either dated or bore their

scribes' names, in two-hundred and fifty libraries and collections in Europe and in the United States, and the elaboration, throughout several decades, of the database created in Jerusalem. I wish to thank all the many co-workers and colleagues who participated with enthusiasm and creativity in the task of documenting, reviewing, processing, computerizing, and improving the retrieval system during the project's five decades. I wish to mention especially my colleague the late Mordecai Glatzer, a senior partner meticulous in the documentation and description of the manuscripts, who made a crucial contribution to the conversion of the questionnaire data into our database in the early stages of the computerization, and the late Leah Shalem, who documented many manuscripts in European libraries during the project's early phase; Edna Engel, who delved deeply into the study of the scripts, developing and elaborating this field; and Tamar Leiter, who significantly advanced the database and retrieval software. I owe special thanks to Nurit Pasternak, the most challenging, rigorous and insightful critic of my work. I am also grateful to Eylon Meroz, who programmed the computerized the codicological database (SfarData) with its sophisticated processing and retrieval software, accompanied the project for many years and with both wisdom and resourcefulness, led the programming team, and oversaw the transformation of the database into an accessible website. Moreover, I am profoundly indebted to the National Library of Israel (formerly the Jewish National and University Library, which I directed in the years 1979-1990), which housed the project from its inception in 1965, and provided it with essential services. I am similarly indebted to the Institute of Microfilmed Hebrew Manuscripts at the National Library in Jerusalem (which I had the privilege of directing from 1970 to 1978) and to its staff, under the direction of the late Yisrael Ta-Shma and later by Benjamin Richler. The rich collection of microfilmed manuscripts housed there aided me in reviewing the data documented for the manuscripts examined in their respective libraries. My colleague and friend, Ephraim Wust, who until recently was in charge of the Arabic manuscripts in the National Library, always assisted me willingly.

For more than thirty years I have taught introductory courses and seminars in the field of Hebrew codicology to advanced students at the Hebrew University. The dialogue with my students in those classes enriched my research significantly and I am grateful to them for this. A source of inspiration and knowledge of the modes of presentation of Latin codicology was a draft of a number of the basic chapters prepared by the late J.

Peter Gumbert, formerly Professor of Latin Palaeography at Leiden University, who was a fellow at the Hebrew University's Institute of Advanced Studies in 1991 in a group I initiated on comparative codicology. I am grateful to him for making this draft available to me.

I shall conclude after the manner of the author and scribe Sa'adya ben David 'Adani, who, upon completing his many copied texts, would beg forgiveness in his colophons "for any mistakes or errors I committed, and for adding or omitting" (על כל מה ששגיתי וטעיתי והוספתי וגרעתי).

Chapter 1: Introduction

1. The codex

The books produced in Hebrew scripts during the Middle Ages prior to the invention of the printing press, just like those written in other scripts in regions surrounding the Mediterranean basin – the Middle East, Central Asia, Europe, and North Africa – were shaped as codices, unlike the books of the ancient world, which were inscribed on scrolls. These cultural artefacts that mediated between the authors or editors of texts and their readers, embodied verbal messages – whether concrete or abstract – in a material and visual form. They guaranteed cultural continuity and cohesion and, at the same time, were receptacles of new concepts and ideas – be they religious, philosophical, literary, or scientific – and an effective vehicle for their dissemination and propagation over vast areas. Multiple factors and interests converged in the making of books: overt and covert, conscious and unconscious, material and technical, graphic and artistic, textual and semiotic, economic and ergonometric. The various technologies, the complex processes of the material production, designing the copying according to aesthetic principles and functional needs, the inputs invested by scribes to make the hierarchical structure of the copied text transparent and to improve readability and usability, as well as the range of economic considerations and constraints that were part of the manual book production and the hand-copying of the text – these manifold elements combined make this preindustrial object, the codex, one of the most complex products manufactured during the Middle Ages.[1] There is no doubt that the production patterns of the codex and their regularity can be accredited with the rapid spread and the refining of the printing press during the second half of the fifteenth century, and with its revolutionary impact on the social and cultural history of European countries in general and of the Jewish people in particular.

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[1] Cf. the title of the article by C. Bozzolo et al., 'Une machine au fonctionnement complexe: Le livre médiéval', in *Le texte et son inscription*, ed. R. Laufer, Paris 1989, p. 69.

This work does not deal with social and conceptual aspects of the history of the book or of the history of reading, apart from the detailed discussion of the unique circumstances of Hebrew book production in section 5 of the current chapter as well as the discussion of the copyists' involvement in the textual interpretation and reception of the texts (in chapter 8) and of their involvement in the editing of texts (in chapter 13). Only sparingly does it investigate the mutual interactions between author and text, between the copyist in charge of the text's transparency and readability and the reader who used the text or the scholar who copied it for his own use, revising it, glossing it and otherwise altering it. Since the manual production of Hebrew books was an individual endeavour, the current work does not deal with the social networks engaged in book production and consumption, a topic intensively treated in recent years by scholars who study the history of the book in the printing era.

The copying of a book was first and foremost an act of physical manufacturing. A text which is inherently verbal may be transmitted through the mediation of the voice and of aural perception, namely as 'oral transmission', or visually, as 'written transmission'. The visual embodiment of the text and the means for its storage, distribution and preservation are all material. Codices copied in the Hebrew script, as in other scripts, were therefore elaborate products, moulded by a rich variety of materials, techniques, and technologies. As such, they were designed in keeping with the aesthetic and functional principles and considerations which dictated visual regularity and uniform disposition of the text in the book's openings. In the regions where Hebrew books were produced during the Middle Ages we witness an entire configuration of traditions, patterns, and practices which were preserved continuously for hundreds of years, remaining untouched by the substantial transformations in bookmaking practices that sprouted and prevailed in the host environment; along with them we can observe technological transformations and significant developments in the techniques of Hebrew book production and manuscript design which, as a rule, had taken place within Christian or Muslim societies at an earlier stage.[2] The nature of these transformations can be gauged and their ergonometric or economic determinants, or even elusive aesthetic reasons, uncovered or surmised, as can be considerations concerned with the

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[2] Compare Michel Foucault's remarks about continuity and discontinuity in the methodology of history in his *Archeology of Knowledge*, tr. A.M. Sheridan, London 1972, pp. 21-30.

level of the text's readability and transparency, or with the scholastic needs of the educated elites.[3]

The diffusion of the codex and its late adoption by the Jews

A codex is composed of quires comprising a number of folded bifolia, which, after being sewn and bound, allowed easy leafing through the book. The diffusion of codex production in the regions around the Mediterranean basin and the gradual supplanting of the old scroll form were a product of both material and cultural factors. As a receptacle of texts the codex is more capacious, more durable and easier to use, to carry about and to store than the scroll. There is no doubt that the technological transition from scroll to codex left a revolutionary imprint on the cultural history of these regions. The Christians adopted the codex as early as the first centuries of the Common Era for the dissemination of their holy scriptures; after 300 C.E. the codex increasingly became the main book-form used for Greek, Latin, and Coptic Christian texts. Gradually, the book-form of classical non-Christian, so-called pagan literature, took in its turn the shape of the codex, until the scroll's eventual disappearance in the sixth century C.E., when it no longer served as a vehicle for literary texts.[4] The Jews, on the other hand, adopted the codex much later, not before the Muslim period and the beginning of the Geonic literary activity, and presumably no earlier than the eighth century. This is attested to by the contextual uses of the word *sefer* (ספר) in talmudic and Midrashic literature as well as by the finds of books in Hebrew scripts, by literary testimonies and by the terms used for 'codex' in Hebrew sources.

Rashi (Shelomo ben Yitsḥaq, 1040-1050) had already observed, in relation to the talmudic sources, that ספרים שהיו בימי חכמים כולן בגיליון כספר תורה שלנו ('The books in

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[3] See Beit-Arié, 'The History of the Production', and in greater detail, Beit-Arié, *Unveiled Faces*.

[4] See Turner, *Early Codex*; Roberts & Skeat, *Birth of the Codex*, p. 75; I.M. Resnick, 'The Codex in Early Jewish and Christian Communities', *The Journal of Religious History*, 17 (1972–1973), pp. 1–17; M. McCormick, 'The Birth of the Codex and the Apostolic Life-Style', *Scriptorium*, 39 (1985), pp. 150–158; J. van Haelst, 'Les origines du codex', in *Les débuts du codex – Actes de la journée d'étude organisée à Paris les 3 et 4 juillet 1985*, ed. A. Blanchard (Bibliologia 9), Turnhout 1989, pp. 13–35. For a summary of the earlier literature, see C.C. Crown, 'Codex and Roll in the NT', *Harvard Theological Review*, 34 (1941), pp. 219–250. The transition from the scroll form to the codex more or less overlapped the transition from papyrus to parchment as writing material; however, the finds detailed by Turner show that the two transitions were not interdependent processes. Roberts & Skeat contend that the possibility that the papyrus codex and the parchment codex developed concurrently should not be discounted, and that in any case, the transition from papyrus to parchment was unrelated to the transition from the scroll to the codex (ibid., pp. 5-19).

the times of the Sages were all in the form of scrolls, like our Tora scroll').[5] An obscure and puzzling gap of some eight hundred years exists between the abundant finds of Hebrew books dating from the late antiquity (namely the Dead Sea Scrolls and the fragments from the Qumran caves and the Judaean Desert dating from the Hellenistic and early Roman period) and the earliest explicitly dated surviving Hebrew codices. From that period in time there is hardly any extant evidence of the Hebrew book, apart from a few dozen surviving fragments in Hebrew book-hand.[6] Some of these remnants, most of which were inscribed on papyrus during the Byzantine period and discovered in archaeological excavations in Egypt together with Greek papyri, are documentary in nature and only a few are literary texts. Many of these papyri are written in Judaeo-Arabic[7], and therefore they should undoubtedly be dated toward the end of the gap period, and perhaps even beyond it. Among the existing papyrus fragments that contained literary texts, not one can be proven to have derived from a codex.[8] The late

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[5] Rashi on the Babylonian Talmud, Megilla, 19a, lemma הכתובה בין הכתובים. First cited by Blau, *Althebräischen Buchwesen*, p. 40, note 5. In A. Ahrend, *Rashi's Commentary on Tractate Megilla: A Critical Edition (based on the Pesaro printing of 1518)*, Jerusalem 2008 (in Hebrew), pp. 206, a parenthetical phrase was erroneously inserted ספרים שהיו בימי החכמים (היו עשויין) כולן בגליון כספר התורה שלנו (The editor remarks, 'as in a number of witnesses and the 'Or Zarua'). See also the commentary on Megilla 5b, on the words כל ספריהן עשויין כגיליון :לתופרן בגידין ('all their books were in the form of scrolls') (Ahrend edition, p. 149, and see the textual versions cited there). In Rashi's commentary on Eruvin 97b, on the words היה קורא בספר :מסורת הש״ס <מסורת הש״ס בגליון עשויין הראשונים בימי העשויים ספרים כל צ״ל בגלילה> 'כספר תורה שלנו ('all the books made in the times of the Rishonim [=early Sages] were in the form of scrolls, like our Tora scroll'). See also Rashi's commentary elsewhere: Bava Metzi'a 29b; Bava Batra 11a; Gittin 60a, and elsewhere. (Cf. the words of R. Yitsḥaq ben Shemuel – the elder Rabbi Yitsḥaq – mentioned in a citation of his responsum in the Vitry Maḥzor, by a disciple of Rashi: אבל חומשים כעין שלנו לא היו כלל בימי חכמים. (but ḥumashim [=Pentateuch codices] like ours did not exist in the time of the Sages) [*Vitry Mahzor*, ed., A. Goldschmidt, vol. 1, Jerusalem, 2004, p. 137]. Conversely, in his commentary on a *baraita* in Shabbat 115b, Rashi interpreted the term טומוס של ברכות (tomus shel berakhot) [see discussion below, on the rotulus, n. 30], as a codex; see section a (a) in the appendix to chapter 4 below. Of course the designation ספרים in Rashi's commentary always refers to biblical books.

[6] All of the papyri and a few of the parchment fragments which were inscribed during this gap – between the latest Judaean Desert scrolls and the earliest codices – were anthologized in one annotated corpus: Sirat, *Papyrus*. An addition to this corpus is a papyrus of a fifth century ketubba: C. Sirat, P. Cauderlier, M. Dukan & M.A. Friedman, La Ketouba de Cologne: *Un contrat de mariage juif à Antinoopolis* (Abhandlungen der rheinisch-westfälischen Akademie der Wissenschaften, Papyrologica Coloniensia 12), Opladen 1986, pp. 72ff.

[7] These papyri have been given a complete critical edition: J. Blau & S. Hopkins, 'Judaeo-Arabic Papyri Collected, Edited, Translated and Analyzed', *Jerusalem Studies in Arabic and Islam*, 9 (1987), pp. 87–160 [= J. Blau, *Studies in Middle Arabic and its Judaeo-Arabic Variety*, Jerusalem 1988, pp. 401–474].

[8] The one exception is a papyrus codex of liturgical poetry (*piyyutim*) consisting of one multiple-bifolium quire which contained at least 24 bifolia (48 folios), in the manner of non-Hebrew codices during the first few hundred years of the codex's use. However, this codex is not an early one, and is likely to have

adoption of the codex form by Jews is also reflected in the late appearance of a term designating this form in Hebrew sources. In extant post-talmudic texts, this term is apparently mentioned in the ancient treatise *Halakhot Pesuqot*, attributed to Yehudai Gaon, who served in his old-age as head of the *yeshiva* in the Babylonian town of Sura during the years 757-761. In the extant version of this text – which most likely was authored or written down by the disciples of Yehudai Gaon, who was blind, and under his supervision[9] – the relevant passage mentioning the codex form is missing, but both the later Hebrew translation and adaptation of *Halakhot pesuqot*, entitled *Hilkhot Re'u* and the treatise *Halakhot Gedolot* mention the term מצחף (*mitṣḥaf* or *mutṣḥaf*),[10] a loanword from Arabic.[11] This Arabic word was adopted as a proper Hebrew word and was used to designate a book in the form of a codex in ancient colophons and ownership notes in the tenth and early eleventh century[12] in the Middle East. Eventually it was also used in book-lists. Yet another term for codex – *daftar* (דפתר) – used in ancient colophons and ownership notes in the Orient,[13] was borrowed from the Arabic of the

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been produced in the eighth century; therefore it cannot disprove the assumption concerning the late adoption of the codex by the Jews. See Sirat, *Papyrus*, pp. 69-82, and plate XVIII.

[9] See N. Danzig, *Introduction to Halakhot Pesuqot with a Supplement to Halakhot Pesuqot*, New York-Jerusalem, 1993 (in Hebrew), pp. 26-31. See Y. Brody's review, 'Meḥqar sifrut ha-halakha mi-tequfat ha-Ge'onim', *Tarbiz*, 64 (1994), pp. 139-152 (in Hebrew), in which he claims that the treatise attributed to Yehudai Gaon was authored outside of Babylonia, and does not at all represent his teachings (ibid., pp. 142-147).

[10] See in detail Glatzer, 'Aleppo', pp. 260-261. Glatzer argues that indeed, the term מצחף (mitṣḥaf) appears in one of Yehudai Gaon's abbreviated responsa concerning the same topic but that the word had been corrupted as מציעה; however, this speculation can be doubted. Danzig remarks that the term mitṣḥaf, which does not appear in the original *Halakhot pesuqot*, was introduced in the Hebrew translation, entitled *Hilkhot re'u*, in accordance with its appearance in the later book *Halakhot gedolot*. Cf. Danzig, 'Ruling', p. 338, note 152.

[11] Etymologically, the term muṣḥaf in Arabic was derived from the term saḥifa in the Qur'an, where it means 'scroll' (just as terms that designated a scroll in Greek and Latin were used to designate a codex after the transformation of the book form). See the article by Ory (below, n. 32), p. 88. See also J. Sadan, 'On "Torah" in the Middle Ages', *Jerusalem Studies in Jewish Thought*, 2 (1983), p. 408, note 15 (in Hebrew).

[12] The term first appears in the colophon of the earliest non-fragmented dated codex whose date is ascertained, MS St. Petersburg Евр. I B 3, Latter Prophets with Babylonian vocalization, inscribed in 916 (see *Codices hebraicis*, Part I, ms. 3). In the modern era, M.Z. Segal proposed that the term mitṣḥaf be used 'especially for an exemplar of a handwritten book – a codex' ('He'arot', Lešonenu, 1 [1928-1929], p. 321 (in Hebrew).

[13] The term first appears in a colophon dedicated to the owner in a manuscript containing what seemed to be the earliest date found in any Hebrew codex: a manuscript of Prophets inscribed allegedly by Moshe ben 'Asher, the Tiberian Masorete, in 894/5 (see *Codiced hebraicis*, Part I, ms. 1). In a book-list from the Qayrawan mosque (copied in 1294, but based on a copy inscribed no later than 907 or 908), the terms daftar or sifr refer exclusively to books that are not Qur'ans, and it would seem that the term sifr was

early Muslim period.[14] Another term designating a codex in Hebrew sources is a Hebrew neologism – *maḥzor*. This term too appears in a number of colophons from the tenth century and the first half of the eleventh century and perhaps even earlier, and, like the other terms, was not long-lived.[15]

Roberts and Skeat contend that the Jews, who wrote their scriptures on scrolls according to the dictates of Jewish law, were unlikely to replace them with codices. The Christians, on the other hand, did not refrain from adopting the revolutionary codex technology in order to propagate their holy writs. It may be that the desire to differentiate themselves from the Jews (and from the pagans of that era), who persisted in writing their scriptures on scrolls, was another reason for Christians to adopt the codex form, apart from its evident practical advantages.[16] One may presume that the diffusion of the codex among the Christians elicited a counter-response from the Jews, who must have been reluctant to adopt this book-form because of its associations with

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used to designate a bound book, while the daftar normally designated an unbound book. See A. Gacek, 'The Ancient Sijill of Qayrawan', *MELA Note*s, 46 (Winter 1989), pp. 26–29.

[14] This term originated from Greek, where it was used to designate a certain type of parchment, and it is used in this sense in talmudic literature (διφτέρα, דיפתרא). See Lieberman, *Hellenism*, pp. 205-208. See also *Encyclopaedia of Islam*², s.v. 'Daftar' by B. Lewis, vol. 2, Leiden–London 1965, cols. 77–81.

[15] The term was explicitly used in the sense of a codex for the first time in 924 (see *Codices hebraicis*, Part I, Manuscrit 4). It also appears in the colophon of the Prophets manuscript written allegedly by Moshe ben Asher in 894/5. For the term, see Glatzer, 'Aleppo', p. 261-263.

[16] Roberts & Skeat, *Birth of the Codex,* p. 60. Katz had already suggested that the use of the codex instead of scrolls by the early Christians was motivated by a desire to visibly distinguish Christianity from Judaism. See P. Katz, 'The Early Christians' Use of Codices instead of Rolls', *JTS*, 46 (1945), pp. 63–65. Saul Lieberman argued that by adopting the codex the early Christians were imitating the Jews, as he believed that the transition from scroll to codex originated in a Jewish custom. His argument relies on the mention in the talmudic and Midrashic literature of the second half of the second century of another container of written texts other than the scroll, called פנקס (pinkas). See Lieberman, *Hellenism*, pp. 203-208. This loanword from Greek (πίναζ) was used to designate a device made of joined wooden plates, used for writing lists and accounts and known from archaeological finds and paintings of the Greco-Roman world. Even if we surmise that the *pinax*, which can be viewed as a sort of proto-codex, was in use by Palestinian Jews before it came to be used in the Roman world, the פנקס mentioned in the talmudic and Midrashic literature was in no way the forerunner of the codex but rather a variation of the scroll. As Menahem Haran correctly concluded from several descriptions of the פנקס mentioned in the Talmud and Midrash for metaphorical purposes, this was not the Roman pinax, which plates were attached to one common axis and which might have been a precursor of the codex, but rather a concertina-like device used earlier among the Greeks. A pinax of that kind was made of concatenated slats, each attached at its end to the top of the next one by an axis. In this manner each slat was fastened to two axes, one at its top and the other at its bottom. See M. Haran, 'Codex, Pinax and Writing Slat', in *Studies in Memory of Abraham Wasserstein*, vol. 1, ed. H.H. Cotton, J.J. Price & D.J. Wasserstein, [special issue, *Scripta Classica Israelica*, 15 (1996), pp. 212–222]. The use of this kind of pinax is also evidenced in visual representations of Babylonian, Aramaic, and Egyptian scribes in antiquity, and similarly by other finds. See C. Sirat, 'Le codex de bois', in *Les débuts du codex* (above, n. 4), pp. 37–40.

Christianity, and that they therefore adhered to the ancient form of the scroll for several more centuries in order to differentiate themselves from the Christians.[17]

It is no wonder, then, that to-date no Hebrew codices have been found from the centuries which elapsed between the latest scrolls found in the Judaean Desert and the earliest Hebrew codices. The earliest explicitly dated Hebrew codices, which dates can be ascertained originate from as late as the beginning of the tenth century.[18] However, the analysis of the script and the identification of other markers of antiquity permit us to conclude that among the tens of thousands of Geniza fragments found in Fusṭāṭ (ancient Cairo) - especially from the Ben Ezra synagogue of the Palestinian community – a small number of book fragments deriving from earlier periods were also preserved.[19] At any rate, the earliest surviving manuscripts, mostly deriving from the Middle East, already demonstrate a mature and elaborate craftsmanship, a sophisticated and coherent technical tradition, as well as regular and transparent production practices, surely attesting to a long-established and continuous tradition of book-making and design, which predates the earliest extant codices.[20]

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[17] I have not been able to find out whether the representations of the four evangelists holding a codex in their hands as against those of the Old Testament prophets (including Moses), who hold scrolls, as seen, for example, in the mosaics of the San Vitale basilica in Ravenna, Italy, are typical of Christian iconography of the Byzantine era and later, and whether they preserve and reflect this dichotomous book culture.

[18] For the intricacy of establishing the authenticity of the date of the most ancient colophon – a manuscript of Prophets, which according to its colophon was copied in Tiberias in 894/5, see below, section 4, and in detail in *Codices hebraicis*, Part I, Manuscrit 1.

[19] Such as fragments of the Babylonian Talmud, the Mishna, Midrash, Bereshit Raba, and Yanai's liturgical poems (*piyyutim*) in palimpsests (ניר מחוק in the talmudic phrase, see e.g. Mishna, Avot 4:20, and elsewhere), inscribed on folios from Christian manuscripts which had originally been written in Palestinian Christian Aramaic, in Greek, or in Syriac. See M. Sokoloff & J. Yahalom, 'Christian Palimpsests from the Cairo Geniza', *Revue d'histoire des textes*, 8 (1978), pp. 109–32; *The Christian Palestinian Aramaic Old Testament and Apocrypha Version from the Early Period*, ed. C. Müller-Kessler & M. Sokoloff, Groningen 1997. It is possible that a number of Geniza fragments vocalized in the Babylonian or the Palestinian manner – vocalizations which beginnings predate the Tiberian system – originate in codices inscribed before the 10th century, such as some of the seventy fragments appended as a facsimile in Kahle's article, P. Kahle, 'Die hebräischen Bibelhandschriften aus Babylonien', *Zeitschrift für die alttestamentliche Wissenschaf*t, 46 (1928), pp. 113–137 (printed also as a separate publication, Giessen 1928). See also the following anthologies of reproductions: *A collection of Mishnaic Geniza Fragments with Babylonian Vocalization*, ed. Y. Yeivin, Jerusalem 1974 (in Hebrew); *Qit'ei Geniza shel ha-Mishna, Talmud, u-Midrash menuqqadim be-niqqud Erets-Yisrael*, ed. N. Allony, Jerusalem 1973 (in Hebrew).

[20] See the Hebrew introduction to *Codices hebraicis*, Part I, p. 15.

This said, one nevertheless wonders why there have hardly been any finds of Hebrew scroll fragments from the time elapsed between the Judaean Desert scrolls and the earliest remains of codices, which had not been produced before the ninth century, or possibly slightly earlier. Thousands of Latin manuscripts have survived from the same time period,[21] as have many tens of thousands of Greek papyri, most of which were discovered in Egypt. No doubt, the lack of manuscript remains of post-biblical literature, designated 'oral literature', can be explained by assuming that until the Arab conquest, or until the beginning of the Geonic period, Hebrew literary creations were for the most part transmitted orally, at least till they had reached their final editing and perhaps even later. This oral transmission was used for the texts of the Mishna, Tosefta, the Talmuds, Midreshei Halakha, the earliest Midrashim, and perhaps other texts as well - such as the earliest stratum of the mystical Heikhalot literature, as well as treatises from the Apocrypha and apocalyptic literature – which may have been composed originally in Hebrew. This view is nowadays one of the cornerstones of talmudic literature research, and it is confirmed by the explicit testimony of the Geonim that even though the talmudic text had already been put into writing its oral transmission had been carried on during their own lifetime. This view is similarly confirmed by the textual evidence derived from the talmudic literature itself, whether through its literary patterns or through its textual criticism.[22] The notion that תורה שבעל-פה ("Oral Law"),

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[21] See the multivolume corpus compiled by Lowe, *CLA*, containing almost 2000 Latin manuscripts or manuscript fragments written before 800. According to the catalogue prepared by Bernhard Bischoff during his lifetime, more than seven thousand Latin manuscripts produced during the 9th century alone on the European continent - save the Iberian peninsula (and the British Isles) – have survived. See his catalogue, which is being published piecemeal: B. Bischoff, *Katalog der festländischen Handschriften des neunten Jahrhunderts [mit Ausnahme der wisigotischen]*, vols. 1–2, Wiesbaden 1998–2004, and see B. Ebersperger, 'Bernhard Bischoff's Catalogue of Ninth-Century Continental Manuscripts', *Gazette du livre médiéval*, 34 (1999), p. 44.

[22] Yaakov Sussmann has recently discussed this basis for understanding the transmission of talmudic literature, summarizing and analysing the various views presented in the broad research literature in a comprehensive article, see Y. Sussmann, '"Torah she-be-'al-pe" peshuta ke-mashma'a: koḥo shel qotso shel yod', in *Mehqerei Talmud: Talmudic Studies Dedicated to the Memory of Professor Ephraim E. Urbach*, ed. Y. Sussmann & D. Rosenthal (*Talmudic Studies* 3), Jerusalem 2005, pp. 209-384 (in Hebrew). Sussmann was able to furnish many new evidences to validate the view, already put forward by Löw And Blau (even by Rashi!), that the oral law had not been in writing during the times of the talmudic Sages, and almost all reference to books referred in fact to the holy scriptures, i.e., the books of the Hebrew Bible (which, of course, were written on scrolls). Sussman concludes that the gradual transition from oral to written literature occurred during in the period between the times of the Mishna and Talmud and the Geonic period (between the fifth and eighth centuries), about which we have very little knowledge. 'It is safe to assume that in those times of duress for the Jews, a time of political and cultural upheavals, when the existence of the Tora of the Jews was in real danger, there arose a need to

even when committed to writing for archival purposes, ought to be disseminated to the public through recitation (assuming perhaps, as did the Greeks, that oral transmission and repetitive recitation would reduce potential corruptions of the text caused by the copying mechanism[23]) may be counted as another possible reason for avoiding the codex form. The continued use of the scroll, which made searching very cumbersome, seems to have conformed to a reality in which putting a text in writing was either prohibited or strictly limited to a small number of copies, so as to monitor the text and preserve it. The adoption of the codex by the Jews could take place only after the attitude towards text dissemination had changed, and after the shift from oral to visual transmission.[24]

Our hypothesis, based on the earliest codices that were found, that the use of the codex emerged not before the eighth century, is consistent with literary testimonies from the Geonic period about eighth-century copies of the Mishna and Talmud, and explicitly from the late-eighth and early-ninth centuries.[25] And yet, the well-grounded assumption

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guarantee the preservation of the oral law, so that it would not be forgotten. Slowly, and having no other choice, the rabbinic scholars permitted themselves to put into writing all that had been carefully preserved in a long chain of transmission' (trans. I.G) (ibid., p. 324).

[23] It is not unlikely that the reasoning behind the preference for oral transmission was similar to that put forward in the famous critique of the invention of writing that Socrates attributed to the King of Egypt (Plato, Phaedrus, 274–275). According to this story, learning how to write would lead to forgetfulness, for by relying on writing people would stop using their memories; they would not retrieve their knowledge from within, but through the mediation of external signs. For references to literature discussing this story, see M.T. Clanchy, *From Memory to Written Record: England 1088–1307*, Cambridge, Mass. 1979, p. 233.

[24] Stern discusses the effects of this transition on the shaping of the Masora in biblical codices, and on the development of biblical interpretation, in D. Stern, 'The First Jewish Books and the Early History of Jewish Reading', *JQR*, 98 (2008), pp. 196–202.

[25] See Sussmann, '"Torah she-be-'al-pe" peshuta ke-mashma'a' (above, n. 22), pp. 297-298, 325-327, 330 (note 32). David Rosenthal has noted the most ancient indirect evidences for the existence of manuscripts of oral law, which may point to the existence of written copies of the Talmud in the eighth century. According to his analysis of the text in the Babylonian Talmud, Avoda Zara, 9a, he suggests that one may conclude that a written Talmud existed already in 688. See D. Rosenthal, *Mishna Avoda Zara – Mahadura biqortit u-mavo*', Jerusalem 1981, [Introductory volume], p. 96-106 (in Hebrew). For our purposes it would obviously be impossible to deduce whether these evidences point to the existence of codices or of scrolls. However, Sussmann (op. cit. p. 330, note 32) emphasises once more Maimonides' words in *Mishne Tora* (Hilkhot Malve ve-Love 15:2) mentioning תלמוד ישן כתוב על הגוילים כמו שהיו כותבים קודם לזמן הזה בקרוב חמש מאות שנה ('an old Talmud inscribed on scrolls such as they used to write before current times, some five hundred years ago'). Maimonides' estimate may not have been far from the actual production of that Talmud, which was still inscribed on scrolls (גוילים). See also the responsum by Rav Sherira Gaon, from 988, on 'books of Tractate Nidda written more than two hundred years ago', Newly Discovered Responsa, ed. S. Emmanuel, Jerusalem 1995, p. 159, section 118 (in Hebrew); S. Emmanuel, 'A Responsum of Samuel Eli Gaon of Baghdad to the Talmudic Scholars of France', *Tarbiz*, 66 (1996), p. 96, note 11 (in Hebrew).

that Hebrew literature was transmitted mostly in oral form cannot explain the near absolute absence of remains of Tora scrolls, which, no doubt, were inscribed and consumed on a large scale. This absence indicates that the remarkable paucity of remains of Hebrew handwritten texts during this long, obscure period cannot be attributed to oral transmission alone. It may be that particular circumstances – both material and political - which had not been the lot of consumers of Greek, Coptic, and Latin texts, led to the loss of Hebrew books remains. Indeed, the one surviving text to date of a literary scroll that predates the 8th century – portions of the Yom Kippur liturgy and *piyyutim* – survived due to its re-use in Latin manuscripts in Europe. At first, this liturgical scroll was cut into folios for the purpose of inscribing a Latin text over the Hebrew text (a palimpsest) at the Bobbio Abbey in northern Italy in the early eighth century. Subsequently, these same folios were cut and inserted as protective flyleaves into a later Latin codex.[26]

A vertical rotulus
MS Oxford MS a3

The rotulus

A rather large number of scroll fragments containing literary, liturgical, Midrashic, and exegetical texts were uncovered in the Fusṭāṭ Geniza. Only a few were traditional horizontal scrolls, of the kind of the Munich palimpsest, indicating that the scroll did not disappear entirely once the Jewish copyists adopted the codex book-form.[27] Most of these remains

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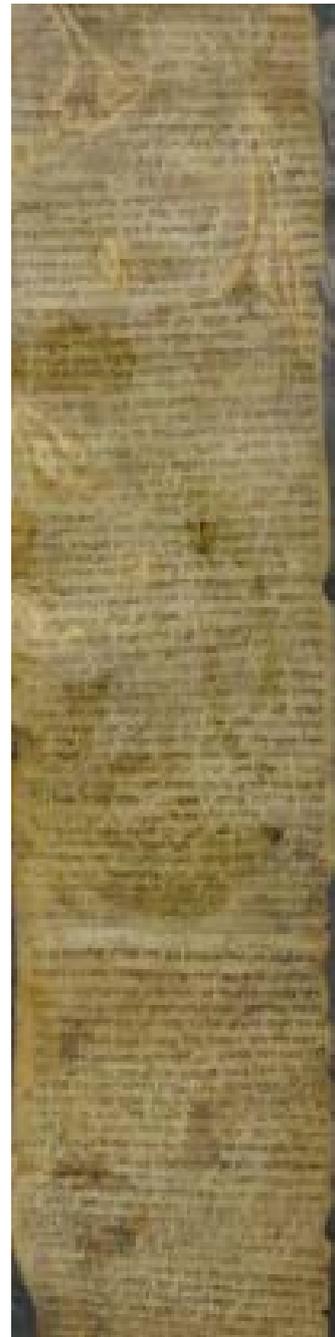
[26] M. Beit-Arié, 'The Munich Palimpsest: A Hebrew Scroll Written before the Eighth Century', *Kirjath Sepher*, 43 (1967-68) (in Hebrew).

[27] The most impressive horizontal scroll in terms of size, state of preservation, and script is a fragment, MS Cambridge Misc. 25.53.17, which contains the Babylonian Talmud Hulin, 101a-105a. See S. Friedman, 'An Ancient Scroll Fragment (B. Ḥulin 101a–105a) and the Rediscovery of the Babylonian Branch of Tannaitic Hebrew', *JQR*, 86 (1995), pp. 20–46.

were found to be fragments of scrolls rolled and unfurled vertically and inscribed in one long and continuous vertical column.[28]

Scrolls of this kind were well known already in Antiquity and, as evidenced by Pharaonic, Ptolemaic, Hellenistic, and Roman papyri in Egypt, were used exclusively for documentary purposes, as they were to a large extent later, in the early Middle Ages.[29] This type of scroll is mentioned in the Mishna, in the Tosefta, and in both Babylonian and Palestinian Talmuds, and was designated by a special Hebrew term that well described it – תכריך (*takhrikh*, rotulus): תכריך של שטרות (*takhrikh shel shetarot*, rotulus of deeds), or תכריך של ברכות (*takhrikh shel berakhot*, rotulus of benedictions, indicating a scroll containing literary materials). The Babylonian Talmud, Bava Metsiʿa 20b explains the nature of the תכריך של שטרות mentioned in the Mishna, Bava Metsiʿa 1:8 (מצא בחפיסה או בדלסקמא תכריך שלשטרות או אֲגֻדה שלשטרות – הרי זה יחזיר) : ′תנו רבנן כמה תכריך של שטרות שלשה שטרות כרוכין זה בזה וכמה היא אגודה שלשטרות שלשה קשורין זה בזה שמעת מינה קשר סימן תני ר′ חייא שלשה כרוכין זה בזה אי הכי היינו תכריך תכריך כל חד וחד בריש חבריה אגודה דרמו אהדדי וכריכי′. According to the cited *baraita* ('external', non-codified Mishnaic source) of Rabbi Hiyya, a תכריך של שטרות contains documents that are glued to one another top to bottom, then rolled in the manner of a scroll, whereas an אגודה (*aguda*) contains several deeds stacked one on top of the other, then rolled.[30]

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[28] See Beit-Arié, 'Palimpsest', (above, n. 26), p. 417, n. 29; M. Bregman, 'An Early Fragment of Avot De-Rabbi Natan from a Scroll', *Tarbiz*, 52 (1983) (in Hebrew), pp. 201-222, esp. p. 203, n. 3. Two Byzantine vertical scrolls containing an unknown commentary on the books of Ezekiel and Minor Prophets, interspersed with Greek words and phrases in Hebrew transliteration have been published and studied: MS Jerusalem Heb. 4o 577.7/1 and MSS Cambridge 32.1, K27.46, F2(1).211, T–S C2.87 (the fragments of the long scroll), K27.47, T–S K25.288 (the fragments of the short scroll). The text in both scrolls is continuous and inscribed on both sides of the parchment by the same hand. For the plates, see N.R.M. De Lange, *Greek Jewish Texts from the Cairo Genizah* (Texte und Studien zum antiken Judentum 51), Tübingen 1966, pp. 402–449; for the physical description of the scrolls, see ibid., pp. 165, 294.

[29] See E.G. Turner, *The Terms Recto and Verso: The Anatomy of the Papyrus Roll - Actes du XVe Congrès International de Papyrologie*, Bruxelles–Louvain 1977, ed. J. Bingen & G. Nachtergael, vol. 1 (Papyrologica Bruxellensia 16), Brussels 1978, pp. 26–53.

[30] The version cited here is that of MS Hamburg Cod. hebr. 19 (according to the Sol and Henkind Talmud Text Databank at the Saul Lieberman Institute). For a different version in the Tosefta, see S. Lieberman, *Tosefta ki-feshuṭah: a comprehensive commentary on the Tosefta*, vol. 9, Neziqin, New York, 1955, p. 150. In Tosefta Shabbat 13:4 and in the Babylonian Talmud Shabbat 115b the version טומוס של ברכות appears. Surely, the Greco-Roman term τομοϛ= tomus does not indicate 'codex', but rather 'scroll', as was its usage in antiquity. Saul Lieberman's commentary implies that this was not a horizontal but rather a vertical scroll. See *Tosefta*, ed. S. Lieberman, *Seder Moed*, New York, 1962, p. 58; *Seder Neziqin*, New York, 1988, p. 49. See also, S. Lieberman, *Hellenism*, p. 303, n. 30; S. Lieberman, *Tosefta ki-feshuṭah,* vol. 3: Seder Moed, New York, 1962, p. 206. Shlomo Naeh has disputed this interpretation, claiming that both טומוס and תכריך described in the Babylonian Talmud, Bava Metsiʿa denote the way in which deeds had been preserved, glued to one another to form a horizontal scroll rather than a rotulus. In his view,

The remains of later Hebrew books in the form of vertical scrolls, called in Latin sources *transversa charta* and in recent times named *rotulus*, plural *rotuli*, corresponds to the late adoption of this book-form in ninth-century Greek and Latin Byzantine liturgies[31] as well as in copies of the Qur'an, as in the finds from the Damascus Geniza.[32] In recent years hundreds of vertical fragmented scrolls from the collections of the Fusṭāṭ Geniza are being uncovered by Judith Olszowy-Schlanger, after Gideon Bohak drew her attention to the many rotuli he had come across while examining Geniza fragments in search of magical texts.[33] Around half of these scrolls were manufactured by piecing together parchment sheets, and half by assembling paper sheets. It appears that the use of this book-form was quite widespread. It overlapped

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both טומוס and תכריך are generic terms for papyrus scrolls. See S. Naeh, in *Shaʿarei Lashon*: *Studies in Hebrew, Aramaic and Jewish languages Presented to Moshe Bar-Asher*, ed. A. Maman, S. E. Fassberg & Y. Breuer, vol. 2 (Rabbinic Hebrew and Aramaic), Jerusalem 2007 (in Hebrew) pp. 250-253. Naeh (ibid., p. 251) attempted to substantiate his theory with the finds of Judaean Desert documents which were glued along their sides, ignoring his own earlier mention of the existence of many tied deeds from the Judaean Desert which lines were inscribed throughout the full length of the papyrus scroll, and were unfurled vertically (op. cit., p. 231-232). See also A. Sperber, *A Dictionary of Greek and Latin Legal Terms in Rabbinic Literature*, [Ramat Gan] 1984, pp. 98–99. A tomus of benedictions – טומוס של ברכות – is also mentioned in Tosefta Shabbat 13:4 (Lieberman edition, op. cit., p. 58): הברכות, אע״פ שיש בהן מאותות השם ומעניינות הרבה שבתורה, אין מצילין אותן אבל נשרפין במקומן. מכן אמרו כותבי ברכות כשורפי תורה. ומעשה באחד שהיה כותב ברכות אמרו עליו לפני ר׳ ישמעאל והלך ר׳ ישמעאל לבודקו. כשהיה עולה בסולם, הרגיש בו. is mentioned only תכריך של ברכות – A rotulus of benedictions - נטל טומוס של ברכות ונתנו לתוך ספל של מים once in the parallel recounting of the same episode in the Palestinian Talmud, Shabbat 16a (15c): מעשה באחד שהיה כותב ברכות והלך ר׳ ישמעאל לבודקו. כיון שהרגיש בקול פעמותיו שלר׳ ישמעאל נטל תכריך שלברכות וזרקן לתוך ספל של מים.

[31] See L.W. Daly, 'Rotuli: Liturgy Rolls and Formal Documents', *Greek, Roman and Byzantine Studies*, 14 (1973), pp. 333–338; G. Cavallo, *Rotoli di Exultet dell'Italia meridionale*, Bari 1973; *Exultet: Rotoli liturgici del medioevo meridionale*, ed. G. Cavallo 1994; A. Jacob, 'Rouleaux grecs et latins dans l'Italie méridionale', in Hoffmann (ed.), *Codicologie comparée*, pp. 96-97. Vertical scrolls in Greek and Latin were also produced later. See M. Maniaci, 'The Liturgical Scroll between Orient and Occident: Ideas for a Comparative Study', *Comparative Oriental Manuscript Studies Newsletter*, 2 (European Science Foundation, Research Networking Programme 2), (July 2011), pp. 16–21.

[32] S. Ory, 'Un nouveau type de muṣḥaf : Inventaire des corans en rouleaux de provenance damascaine conservés à Istanbul', *Revue des études islamiques*, 33 (1965), pp. 87–149; J. Sourdel-Thomine & D. Sourdel, 'À propos des documents de la grande mosquée de Damas conservés à Istanbul', ibid., pp. 73–85. According to the plates appended to the articles, one can see that indeed these are rotuli. On the vicissitudes of the fragments discovered in 1900 inside the Qubbatal-khazna in the Umayyad Great Mosque courtyard see A. D'Ottone, 'Manuscripts as Mirror of a Multilingual and Multicultural Society: the Case of Damascus Find', in *Negotiating Co-Existence: Communities, Cultures and Convivencia in Byzantine Society*, ed. B. Corstini & S. La Porta, Trier 2013, pp. 63-88. See also the useful summary by Ronny Vollandt, 'A Muslim Genizah in Damascus', in Cambridge University Library - *Fragment of the Month*, June 2018.

[33] G. Bohak, 'The Magical Rotuli from the Cairo Genizah', in *Continuity and Innovation in the Magical Tradition*, ed. G. Bohak, Y. Harari & Sh. Shaked (Jerusalem Studies in Religion and Culture 15), Leiden 2011, pp. 321–340.

with the early manifestations of the codex, but continued to be used at least until the eleventh century. According to Olszowy-Schlanger, this type of scroll was common mainly in Egypt during the eleventh century, and its remains include a large variety of texts: about half are liturgical (containing *piyyutim* and some prayers), while the rest include Babylonian Talmud treatises, halakhic literature, *Haftarot* and anthologies of biblical verses, as well as dictionaries and glossaries of medicine and magic. About half of the rotuli were copied on the blank sides of pieces which had been cut off from written documents (some of them Arabic) and stitched together. The sizes of the assembled pieces are not uniform, their width is narrow and their length varies. The shapes and character of the rotuli in Hebrew script suggest, as inferred by Judith Olszowy-Schlanger, that many had served as some kind of personal notebooks. These had been copied and produced by their users – rabbis, scholars, physicians and magicians – for personal and professional use, being low cost and conveniently portable items. Vertical rotuli, whether in Greek, Latin, and Arabic or in Hebrew script, which were still being made during the eleventh century, undermine the assumption that they represent a transitional phase between the traditional scroll and the codex. The dating of some may indicate that their production began during the transition period between the traditional scroll and the codex, but apparently they were still being produced long after the emergence of the codex. The fragments of rotuli found and investigated by Olszowy-Schlanger are compiled in her forthcoming book. The ongoing probing into these documents will no doubt shed light on the usage of this book-form and its circumstances.

2. Codicology – its development, its new approach to the study of the hand-produced book, its trends[34]

The term 'codicology', designating the scientific study of books in the form of a codex from a variety of perspectives (material, technical, technological, scribal, design,

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[34] Denis Muzerelle, a key figure in quantitative codicology, has composed a highly informative historical survey on the development of codicology and the various approaches to it, to which the current review is much indebted. See D. Muzerelle, 'Le progrès en codicologie', in Rationalisierung der Buchherstellung im Mittelalter und in der frühen Neuzeit – Ergebnisse eines *buchgeschichtlichen Seminars, Wolfenbüttel, 12–14 November 1990*, ed. P. Rück & M. Boghardt (Elementa diplomatica 2), Marburg an der Lahn 1994, pp. 33–40. Since the publication of Muzerelle's work, Gumbert has published his own survey, 'Fifty years of Codicology', which assisted me greatly in my own review. For the methodology of codicology in general and that of quantitative codicology in particular, see Derolez, *Codicologie*, I, pp. 7-10; see also his review of the role of codicology in Medieval Studies, A. Derolez, 'La codicologie et les études médiévales', in *Bilan et perspectives des études médiévales en Europe –*

functional, intellectual, and social), was coined by François Masai in 1950 in his pivotal article 'Paléographie et codicologie',[35] published in *Scriptorium*, a journal which he had founded in Brussels a few years earlier, specialising in the study of Occidental manuscripts.[36] This article is regarded as the cornerstone of the young discipline, which later developed and expanded. Masai defined codicology as the archaeology of the manuscript, an autonomous field of research dealing with the material and technical aspects of codex production, alongside palaeography, which dealt with scripts. Recognition of the importance of investigating the material and technical aspects of the Latin manuscripts – besides the history and typology of their scripts, which traditional palaeography saw as its own purpose – had become increasingly widespread as from the last decades of the nineteenth century.[37] During the 1940's and 1950's, scholars began to investigate the various codicological elements, especially pricking and ruling, not by means of theoretical speculation but by examining the writing styles used in scriptoria, thereby discovering that these elements had both local and temporal characteristics. Subsequently, scholars dealing with Latin and Greek manuscripts began to examine larger assemblages of the manuscripts' external characteristics, and discovered that these were shared by groups of the same provenance and time.[38]

Actes du premier congrès européen d'études médiévales, Spoleto, 27–29 mai 1993, ed. J. Hamesse (Fédération internationale des instituts des études médiévales: Textes et études du moyen âge 3), Louvain-La-Neuve 1995, pp. 371–386. See also my review in the Hebrew introduction to *Manuscrits médiévaux*, Part I, pp. ix-x, and the overview lectures presented at the Jubilee meetings of the Comité International de Paléographie Latine (Engine 2003), which were printed in *Archiv für Diplomatik, Schriftgeschichte, Siegel- und Wappenkunde*, 50 (2004), pp. 205–580.

[35] F. Masai, 'Paléographie et codicologie', *Scriptorium*, 4 (1950), pp. 279–293 [=*Codicologica*, vol. 1: *Théories et principes*, ed. A. Gruys & J. P. Gumbert, Leiden 1976, pp. 34–53].

[36] Masai highly commended Batteli's approach, which shifted the gravity centre of palaeography from script to book (G. Battelli, *Lezioni di paleografia*, Vatican City 1936), as well as the similar approach put forth by Dain (A. Dain, *Les manuscrits*, Paris 1936), who had indeed coined the term 'codicologie' before Masai, but attributed a different meaning to it (ibid., pp. 76-78).

[37] Another source for our brief discussion here is Julian Brown's instructive review of the evolvement of the recognition of the importance of the material aspects of manuscripts, as evidenced in the field of Latin palaeography before the emergence of codicology as an independent research field. See T.J. Brown, 'Latin Palaeography since Traube', *Transactions of the Cambridge Bibliographical Society*, 3 (1959/60), pp. 361–381 [=*Codicologica* (above, n. 34), pp. 58–74]. This review is also included in his collected writings: Brown, A *Palaeographer's View*, pp. 17-37. Brown uncovers the roots of the approach that ultimately gave birth to the discipline of codicology. On the German term Handschriftenkunde, coined by Ebert as early as 1825, see J.P. Gumbert, 'Ebert's Codicology a Hundred and Fifty Years Old', *Quaerendo*, 5 (1975), pp. 336–339.

[38] The first example of a comprehensive codicological study is, apparently, Ker's book on English manuscripts after the Norman Conquest, in which he exposed the salient transformations brought about by the conquest in pricking and ruling techniques, in layout types, and in systems for numbering the

Masai did not define codicology as a historical discipline, yet while proclaiming its independence he subordinated it to the palaeographers, philologists, and art historians as a mere auxiliary provider of information. His approach, which has its supporters to this very day, confined the archaeology of the codex to the single, unique manuscript, having no concern with manuscript populations.

In what regards the still ongoing debate about the status of material codicology in relation to traditional palaeography and the appropriate terminology for each of these two aspects of the handwritten and handmade book, my own view is that the term 'codicology' should be used to describe the comprehensive study of all aspects of the codex form, while the old term 'palaeography' – the study of scripts – should refer to the study of one aspect only. Either way, codicology does not regard manuscripts as receptacles designed solely for the transmission and preservation of texts, but also as sophisticated products deserving to be researched in their own right as part of the cultural and social history of the Middle Ages.

During the early 1980's the young discipline underwent a methodological turn of great impact, which in fact transformed it as well as its research. In 1980, Carla Bozzoli and Ezio Ornato published a study entitled *Pour une histoire du livre manuscrit au Moyen Age: Trois essais de codicologie quantitative*, which became the cornerstone of the school of quantitative codicology[39] under the leadership of Ornato, who established its theoretical foundations. Quantitative codicology adopted positivistic methods - experimental (according to the usage of this term in the social sciences), and empirical. It called for the collecting of measurable data from as many manuscripts as possible, so as to enable their investigation from a variety of angles in order to unveil their typology; at the same time it promoted the approach that regarded the hand-produced book not as an individual item, but as a member of a group, viewing manuscripts as a population.

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quires and in marking their sequence. See N.R. Ker, *English Manuscripts in the Century after the Norman Conquest*, Oxford 1960. Even before that, in 1958-1959, Irigoin was able, on a more limited scale, to demonstrate the tremendous value of codicological research of manuscript groups, with his findings of shared characteristics in Greek manuscripts produced in the same production centre. See Irigoin, 'Centres de copie byzantins'. The most unyielding call to engage in every aspect of manuscript research was formulated by Delaissé, the art historian; see L.M.J. Delaissé, 'Towards a History of the Mediaeval book', in *Miscellanea André Combes*, vol. 2 (Cathedra Sancti Thomae Pontificiae Universitatis Lateranensis 4), Rome 1967, pp. 27–39 [=*Codicologica* (above, n. 34), pp. 75–83].

[39] For the quantitative approach in the study of history, which, in fact, does not directly relate to codicological research but is nonetheless useful in terms of statistical procedures and terminology, see the comprehensive review by K.H. Jaraush & K.A. Hardy, *Quantitative Methods for Historians*, Chapel Hill–London 1991.

The collective codicology approach comprehends all the phases and aspects of the history of the handwritten book – from its making and its production processes, the copying of the text and improving its readability by scribal means, the design of the book openings and their ornamentation, and up to its distribution, reception, preservation, and subsequent transformations. In their theoretical studies, Ornato and his colleagues attempted to spot the technological, functional, economic, social, and intellectual factors that brought about the evolutionary processes manifested in the history of medieval book production.[40] In so doing they transformed a traditionally auxiliary field into a historical discipline designed to expose the 'conditioned functional evolution' of the hand-produced book.[41]

In 1982, a group of codicologists, partisans of the quantitative and collective school, founded a bi-annual journal entitled *Gazette du livre médiéval*, which promoted the quantitative and historical approach and at the same time supplied classified bibliography. In 1984 Albert Derolez, the first Latin codicologist-palaeographer who pointed out the need to establish a synchronic and diachronic typology, published his study of the Humanistic parchment manuscripts produced in Italy.[42] This was the first comprehensive codicological research based on a large corpus of Latin manuscripts (one thousand and two hundred codices), examined by the researcher himself, who thoroughly exhausted in a detailed manner a number of material and technical codicological parameters. This said, Derolez's corpus was monolithic and included manuscripts of one group and one genre only. The corpus of manuscripts on which we founded our own tentative typology, presented as early as 1977, comprised at that time some two thousand manuscripts produced in different regions during different times, and included a number of additional codicological parameters as well.[43]

In fact, the Hebrew Palaeography Project[44] had from the time of its founding in 1965 based its research on a quantitative approach, substantiating this methodology through the comprehensive documentation of the vast majority of dated manuscripts, serving as a basis and framework for unveiling the typologies of the codex in all scripts,[45] albeit

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[40] See the collected papers in Ornato et ses collègues, *La face cachée*.

[41] See Muzerelle, 'Le progrès en codicologie' (above, n. 34), p. 37.

[42] See Derolez, *Codicologie*.

[43] Beit-Arié, Hebrew Codicology.

[44] See preface, above.

[45] In this context one should consider Piper's reservations regarding the extent to which the dated manuscripts are representative, put forth by him in his review of the 1979 catalogue of dated Latin

without establishing theoretical framework. Our approach assumed that the research aimed at bringing to light the evolution of the codex should be carried out only after an exhaustive field-research, the documentation of most of the dated witnesses and the exposure of the typology arising from these data.[46] Therefore, both practically and operatively, Hebrew codicology preceded Latin (and Greek) codicology in employing the quantitative and collective - or sociological - research method.

3. Hebrew Codicology

The codicological investigation of Hebrew manuscripts commenced around the time when the codicological study of manuscripts in the Latin and Greek scripts began, namely as soon as the Hebrew Palaeography Project was founded in 1965 under the sponsorship of the Israel Academy of Sciences and Humanities in Jerusalem, and the Institut de la Recherche et d'Histoire des Textes [IRHT], Centre National de la Recherche Scientifique [CNRS] in Paris. And yet, in reviewing the brief history of Hebrew codicology and palaeography one must not overlook their history, before their formation according to the modern, multi-faceted approach. As a research field involved with all aspects of handwritten texts in the codex form, Hebrew codicology could not have developed and attained its achievements before the emergence and evolution of the codicology of Occidental manuscripts: already the early humanists in Renaissance Italy had started their inquiries into the textual criticism of manuscripts, while palaeographical analysis was first undertaken not before the eighteenth century. The first occurrence of textual criticism of manuscripts as authentic sources of Hebrew texts took place in the framework of the early Wissenschaft des Judenthums movement, חכמת ישראלי, during the first half of the nineteenth century, and in the pioneering investigations of its founder, Leopold Zunz. The study of manuscripts was greatly amplified in the monumental bibliographical undertakings of Moshe (Moritz) Steinschneider. Not only did he examine, describe, catalogue, and classify many

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manuscripts in the British Museum. He argued that since explicitly dated manuscripts were the exception, they may well display other unusual characteristics. Scribes who marked the date of copying in their colophon would also tend also to disclose their names and to express their individuality in their penmanship, while unnamed scribes would do so to a lesser degree, and therefore their copies should be regarded as more representative of their time and place. See A.J. Piper, *Medium Ævum*, 50 (1981), pp. 105–106, review of A.G. Watson, *Catalogue of Dated and Datable Manuscripts c. 700–1600 in the Department of Manuscripts in the British library*, London 1979.

[46] Beit-Arié, 'History of Production'; Beit-Arié, *Unveiled Faces*.

hundreds of manuscripts in the European collections and in England, but he also noticed and commented upon some of their material characteristics and on the scribal traditions of their copyists, devoting to these issues a book (M. Steinschneider, *Vorlesungen über die Kunde hebräischer Handschriften, deren Sammlungen und Verzeichnisse*, Leipzig 1897), which still serves as an general introduction to the field of Hebrew manuscripts. In his introduction, Steinschneider briefly summarised the information about Hebrew manuscripts contained in books and articles published before his time; prior to that he had published a more comprehensive review of such sources relating to Hebrew palaeography: 'Zur Literatur der hebräischen Palaeographie', *Zentralblatt für Bibliothekwesen*, 4 (1887), pp. 165–155. A work by Emmanuel Löw (L. Löw, *Graphische Requisiten und Erzeugnisse bei den Juden*, Leipzig 1870) dealt with writing practices and books in talmudic sources and in medieval halakhic literature. Ludwig Blau devoted his book (L. Blau, *Studien zum althebräischen Buchwesen und zur biblischen Litteraturgeschichte*, Strasbourg 1902) to the material embodiment of the biblical text and its textual implications. The pioneering work of Carlo Bernheimer (C. Bernheimer *Paleografia ebraica*, Florence 1924), in Italian, was the first to present a typology, albeit merely a synchronic one, of the Hebrew scripts that were used in medieval manuscripts, based on a selection of manuscripts in Italian libraries. The codicological aspects that were included in this work were basic, yet some proved to be of great value (such as the classification of biblical manuscripts by their formats and the number of columns and their regional characterisation according to these criteria). Particularly praiseworthy is his farsighted methodological statement that for a correct characterisation of the external attributes of the manuscripts it is imperative to collect statistical data from a large number of manuscripts. The pioneering work of Shlomo Birnbaum (S.A. Birnbaum, *The Hebrew Scripts*, vols.1–2, London–Leiden 1954–1971) was devoted entirely to the diachronic typology of Hebrew scripts, from the ancient Hebrew scripts until the mid-twentieth century.

One should, of course, mention in the context of this brief review the late-nineteenth century to mid-twentieth century catalogues of manuscript collections which descriptions – apart from providing the most detailed and erudite presentations of the manuscripts' contents, the definition of their types of scripts and even their estimated dating – comprise at the same time, some basic codicological aspects. Particularly noteworthy are three of these catalogue authors, whose own praxis anticipated the

theoretical formulations of theories concerning the vital importance of material aspects for the textual research. The first was George Margoliouth, whose catalogue of the Hebrew manuscript collection in the British Museum (G. Margoliouth, *Catalogue of the Hebrew and Samaritan Manuscripts in the British Museum*, vols. 1–3, London 1899–1915) includes information about the manuscript's dimensions, the number of written lines, the composition and number of the quires as well as the devices ensuring their order. He moreover excelled at identifying meticulously the textual layers of the codex (as have done before him Adolf Neubauer in his catalogue of the University of Oxford's manuscripts [A. Neubauer, *Catalogue of the Hebrew Manuscripts in the Bodleian Library and in the College Libraries of Oxford*, vol. 1, Oxford 1886] and M. Steinschneider, whose catalogues distinguished between the layers by defining script types). Second to him was Zacharias Schwarz, who created the detailed and exemplary catalogue of the Austrian National Library collection (A.Z. Schwarz, *Die hebräischen Handschriften in der Nationalbibliothek in Wien*, Leipzig 1925) and similarly a catalogue of Hebrew manuscripts in Austria (A.Z. Schwarz, *Die hebräischen Handschriften in Österreich*, vol. 1, Leipzig 1931). Schwarz also identified the watermarks in the different layers of manuscripts he described. Third, and most outstanding, was Moshe David (Umberto) Cassuto, who, in his Latin catalogue of one hundred and fifteen Hebrew manuscripts of the Vatican Library collection (U. Cassuto, *Codices vaticani hebraici*, [Vatican City] 1956), included many codicological and palaeographic features, together with a meticulous separation of the hands that had collaborated in the copying of the book.

Hebrew codicology, as well as this study, are based on the documentation of visible characteristics, nearly all measurable and capable of being converted into quantitative records, as was undertaken by the Hebrew Palaeography Project in the vast majority of explicitly dated manuscripts. These had been systematically tracked down in libraries and private collections around the world, relying on published catalogues and lists, on research literature, and on the cataloguing undertaken at the Institute of Microfilmed Hebrew Manuscripts in the National and University Library (now National Library of Israel) in Jerusalem. In this framework we undertook the examination and documentation of nearly all extant dated Hebrew manuscripts in some two hundred and fifty libraries in England, Italy, Russia, France, the United States, Israel, Germany, the

Netherlands, Austria, Hungary, Switzerland, Denmark, Spain, Ireland, Egypt, and Belgium. Moreover, most undated manuscripts containing a mention of, or disclosing the copyist's name were located: almost three-quarters of them were fully documented *in situ* in their respective libraries, while the rest were partially documented through microfilms. Nearly all the accessible dated extant manuscripts worldwide have been documented: almost 2,800 codices were thoroughly documented and another 260 or so were partially documented, in addition to nearly 1,600 undated codices in which the name of the copyist was nonetheless stated or had been identified. Since the copying of each scribe who participated in the transcribing of multi-scribe codices was documented separately, the total number of the codicological records amounts to more than 4,300, representing some 3,850 codices, of which about 3,150 are dated.

All the codicological, palaeographical, scribal, bibliographical, and textual information that were documented, including all colophons, were encoded and converted into a computerised database, allowing retrieval of combinations of various codicological, numerical, textual and image data. This database also contains a selection of quality photographs from each manuscript. Moreover, it is equipped with an extremely complex updating and retrieval system developed especially for the needs of codicological research. Known as SfarData, our electronic database, with its sophisticated search possibilities, is, for the present, unique in the world, and represents a methodological breakthrough in what concerns the palaeographical and codicological research of the handwritten codex in all scripts. By means of this database one can have at hand the many tens of thousands data collected (seeing that the codicological variables alone number more than seven hundred for each codicological unit): one can thus classify and group them, perform complex cross-searches, heuristically investigate linkages, and unveil clusters, conditionings and dependencies, establish geo-chronological statistics and view them in graphs and charts, and ultimately set up a typology and characterisations structured on quantitative and measurable foundations and on the reliable supporting frame comprising all the surviving Hebrew dated manuscripts. Moreover, the database itself and the retrieval software developed for it provide a most precise tool available for an identification of the time range and the area of any manuscript bearing no date and place of production: this by singling out all the

dated manuscripts sharing the same combination of characteristics, and by comparing their scripts.[47]

We found that indeed, most of the codicological features of Hebrew manuscripts grouped according to typical regional traditions, some of them exclusive, some common to more than one region, and others are significantly time-related as well. It has been possible to identify developments and transformations in production techniques and book design in the various regions, which warrant further examination in the attempt to uncover their ergonometric, economic, and aesthetic determinants, or those related to text readability or transparency, or even to the scholarly needs of the educated elite.

As we proceeded with our work it became clear that the decision to document all the tangible features of material and textual production was not only entirely justified from the theoretical standpoint concerning the investigation of every facet of the codex; for it was, moreover, necessary for practical reasons as well, given the special circumstances of the Jewish people during the Middle Ages, particularly in Europe. The expulsion of entire communities and entire populations and, on the one hand, the exile imposed on them by the ruling power as part of colonising measures or, on the other hand, the voluntary migrations of individuals for economic or intellectual motives, led to the blurring of distinctive script types and to the coeval cohabitation of several script cultures, especially in Italy and Palestine. Indeed, a fifth of all the dated units were found to have been written by immigrant copyists, who normally continued to employ the script they had used in their countries of origin, while the codicological characteristics of the manuscripts they produced were, partly or entirely, typical of the area in which they were active. In certain areas and in certain periods, the immigrant copyists constituted a majority among the overall number of copyists. In Italy, for example, between the end of the fourteenth century (after 1396, following the persecutions of 1391 in Spain and Provence) and the end of the fifteenth century, more than half of the numerous units produced there (comprising some two-thirds of all the

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[47] On the project, the database and earlier versions of the retrieval system see Beit-Arié, 'SFARDATA'. See also the methods and terms of quantitative analysis set out by Jaruash and Hardy (above, n. 39), which are in line with our own methodological premises and procedures, in regard to the characterisation and identification according to combinations of characteristics, e.g. discriminant function analysis ('whether a set of variables can predict membership in a grouping of cases for which the groups are known a priori', p. 182); multivariate statistics (three or more variables) ('cluster analysis seek to group cases into clusters that are as nearly homogeneous as possible', p. 180).

dated Italian units before 1500 and more than forty percent of all the dated units surviving from all areas in that period) were inscribed in non-Italian scripts but rather in Sefardic scripts by immigrants from the Iberian peninsula and Provence (for the most) and in Ashkenazic scripts by immigrants from the German lands. Obviously, given this reality, the validity of script type as a palaeographic criterion is undermined. Identifying the provenance of a manuscript cannot rely on the script type alone, but on the correlation between it and the codicological profile, which reflects the production zone; and, if the script type does not match the codicological profile, it can then testify to the copyist's origin.[48] No doubt, this conclusion, arising from the research, is one of the central accomplishments of Hebrew codicology, which is multi-faceted and complex due to the broad expanse of the production zones of the Hebrew book in the Middle Ages and to the mobility of its producers.

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[48] For examples of manuscripts localised in the Orient and Italy and inscribed by immigrants who continued to employ the script of their country of origin for many years but whose bookcraft reflects - entirely or at least partially - the practices of the region in which they were active, see Beit-Arié, *Hebrew Codicology*, pp. 104-109.

MS Oxford, Corpus Christi College 133 is to my mind the most instructive illustration of the problematic and complicated nature of Hebrew codicology and palaeography, due to the unique mobility of the Jewish people. This manuscript, inscribed in the early, square and semi-cursive Ashkenazic script, is a copy of a prayer book whose unique text version is presumably descended from the custom of French Jewry, used by the Jews of England before their expulsion in the twelfth century. On two pages which were left blank (fols. 349v and 350r) numerous records were added attesting to payments received from prominent Christians from all over England (be it Bath, Norwich, Exeter or Winchester), half of which had been identified as having been active at the end of the twelfth century. Most unexpectedly, the records — inscribed no doubt by a moneylender who was the manuscript's owner at around 1200 C.E. — were in Judaeo-Arabic in a Sefardic (Andalusian) cursive script! The Sefardic owner of the prayer book noted that his records included מא כאין לי מן די אנא הונא פי אנגלטירה ('all that I own since being here in England'). See Beit-Arié, *Makings*, p. 138 (translation and transliteration of the document by Ephraim Wust), pp. 147-148 (plates of the records); Beit-Arié, *England*, appendix (identification of the local English notables by Zefira Anton-Rokéah).

For the basis of the statistical calculations in this book, see in the introduction below the section titled 'General statistics of the database' (preceding Table 5).

Table 1: Regional distribution of records of the dated manuscripts records inscribed in immigrant scripts until 1540

(1) Total immigrant scripts   (2) Sefardic script   (3) Ashkenazic script   (4) Byzantine script   (5) Italian
(6) Oriental script   (7) Yemenite script   (8) Unidentified immigrant script

number of records   % rate within entire regional corpus

Zone	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	5 #	5 %	6 #	6 %	7 #	7 %	8 #	8 %	Total in corpus
Sefarad	3	0	—	—	2	0	1	0	0	0	0	0	0	0	0	0	**695**
Ashkenaz	3	1	3	1	—	—	0	0	0	0	0	0	0	0	0	0	**422**
Italy	488	45	307	28	165	15	16	1	—	—	0	0	0	0	0	0	**1096**
Byzantium	82	25	76	23	2	1	—	—	4	1	0	0	0	0	0	0	**329**
Orient	55	13	36	8	3	1	5	1	0	0	—	—	11	3	0	0	**434**
Yemen	1	1	0	0	0	0	0	0	0	0	1	1	—	—	0	0	**133**
Unidentified	24	73	12	36	7	21	4	12	1	3	0	0	0	0	10	30	**33**
Total	656	21	434	14	179	6	26	0	5	0	1	0	11	0	10	0	**3142**

Table 2: Regional distribution of records of the dated manuscripts inscribed in immigrant scripts until 1492

(1) Total immigrant scripts (2) Sefardic script (3) Ashkenazic script (4) Byzantine script

(5) Italian script (6) Oriental script (7) Yemenite script (8) Unidentified immigrant script

\# number of records   % rate within entire regional corpus

zone	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	5 #	5 %	6 #	6 %	7 #	7 %	8 #	8 %	Total in Corpus
Sefarad	7	1	–	–	3	0	2	0	0	0	2	0	0	0	0	0	609
Ashkenaz	2	1	2	1	–	–	0	0	0	0	0	0	0	0	0	0	388
Italy	383	45	231	27	136	16	16	2	–	–	0	0	0	0	0	0	853
Byzantium	40	16	36	14	2	1	–	–	2	1	0	0	0	0	0	0	249
Orient	37	10	18	5	3	1	5	1	0	0	–	–	11	3	0	0	378
Yemen	1	1	0	0	0	0	0	0	0	0	1	1	–	–	0	0	95
Unidentified	23	74	12	39	5	16	5	16	1	3	0	0	0	0	–	–	31
Total	493	19	299	11	149	6	28	1	3	0	3	0	11	0	0	0	2603

Table 3: Records of dated manuscripts inscribed in immigrant scripts in Italy between 1396 and 1500

(1) Immigrant script (2) Sefardic script (3) Ashkenazic script (4) Byzantine script

\# number of records   % rate in entire corpus at cited period

Period	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	Total in Corpus
1396-1410	48	58	35	42	10	12	3	4	83
1411-1425	23	32	13	18	8	11	0	0	72
1426-1440	26	40	17	26	6	9	3	5	65
1441-1445	41	53	23	30	18	23	3	4	77
1456-1470	58	50	34	29	23	20	2	2	117
1471-1485	123	63	79	41	45	23	2	1	194
1486-1500	55	54	41	40	16	16	1	1	102
Total	374	53	242	34	126	18	14	2	710

Unlike European quantitative codicology, Hebrew codicology does not refrain from dealing with operative and applied codicology, although it, too, attributes primary importance to the typological and evolutionary study of the diverse populations of Hebrew manuscripts, produced in immensely widespread zones. Moreover, Hebrew codicology frequently applies the results of its quantitative research for identifying the date and provenance of single manuscripts. This has been done both in detailed monographs on specific manuscripts published in facsimile editions[49] and in catalogues of entire collections.[50]

My own reliance on the skeletal data of the dated codices and their statistical classification in order to determine the synchronic and diachronic typology of the Hebrew handwritten book according to regions of production, and in order to attempt to identify the provenance or estimate the time of production, of undated or non-localised manuscripts, is not exempt from flaws and from some methodological difficulties which ought to be emphasised and kept in mind. Evidently, these weaknesses are present in all manuscript typologies relying on the surviving dated manuscripts in any script. The basic fault concerns the extent to which the corpus of dated manuscripts is representative and valid. The corpus indeed includes nearly all extant and accessible dated manuscripts, and in this respect it is in fact total, exhaustive, and not sample-based, yet it comprises only a very small portion of the total number of the extant manuscripts.[51] Moreover, the number of manuscripts it includes is a tiny

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[49] See the descriptions and analyses of four manuscripts in Beit-Arié, *Makings*, pp. 111-248 as well as M. Beit-Arié, 'Introduction', in *Sefer Pitron Torah: a Collection of Midrashim and Interpretations: Facsimile Edition of a Manuscript of The Jewish National and University Library Heb 4° 5767*, Jerusalem 1995, pp. v-xxvii (in Hebrew); idem, 'A Codicological and Palaeographical Examination of the Parma Psalter', in *The Parma Psalter: A Thirteenth-Century Illuminated Hebrew Book of Psalms with a Commentary by Avraham Ibn Ezra – Companion Volume*, London 1996, pp. 11–27; idem, 'The Making of the Miscellany', in *The North French Hebrew Miscellany (British Library Add. MS 11639) – Companion Volume to an Illuminated Manuscript from Thirteenth-Century France in Facsimile*, ed. J. Schonfield, London 2003, pp. 47–73; and see the extensive detailed codicological description included in the important study by Mordecai Glatzer, Glatzer, 'Aleppo'.

[50] See the new catalogues of the large and rich collections in the following libraries: the Bodleian Library at Oxford (Neubauer & Beit-Arié Catalogue), Biblioteca Palatina in Parma (Richler & Beit-Arié Catalogue [Parma]), and the Vatican Library (Richler & Beit-Arié Catalogue [Vatican])

[51] It seems that the explicitly dated Syriac manuscripts that have survived since the time of the earliest dated codex (produced as early as 411), are greater in number than all dated codices in other scripts. Sebastian Brock estimated that the total number of Syriac manuscripts should be more than ten thousand, of which at least three thousand include a notation of date by the copyist. See S.P. Brock, 'The Art of the

fraction of the number of manuscripts which had been produced in the Middle Ages, most of which did not survive. Furthermore, the survival of the dated manuscripts is certainly accidental and most certainly does not reflect in any representative or balanced way those manuscripts which did not survive, nor even the extant ones, in respect to their chronological spread and geographical distribution. To what degree, then, does this corpus represent the multifaceted reality of the six hundred and fifty year-long history of the survival of the Hebrew codex?[52] Such a view of the skeletal basis of documentation of all the extant dated manuscripts turns our exhaustive corpus into a random and unrepresentative one. Are we entitled to retrieve a sound geo-chronological typology from such an accidental assemblage, despite its totality, even when relying on the most rigorous statistical processing methods? To which degree of certainty can we identify a manuscript that bears neither date nor indication of locality, relying on identical combinations of codicological characteristics in the corpus' dated manuscripts?

Another problem relates to the validity of characteristics which statistical classification shows their not being unique to one production zone, but their existing in minor or marginal rates, even to the degree of being atypical, in another zone or zones. Clearly, in such cases, considerations of probability hold little value for specific identification, for we cannot exclude the possibility that the undated and non-localised manuscript we seek to identify codicologically actually represents the marginal and even the exceptional manuscripts in our total yet random corpus. This said, we are certainly allowed to use massive incidences that are unique to a certain region or period for the purpose of collective characterisation, both regional and chronological.

Another limitation of the use of the corpus of dated codices lies in the fact that only some forty three percent of their colophons[53] explicitly indicate the location in which the copying was produced. In six percent of the manuscripts the location has been estimated with a high degree of probability based on other manuscripts copied by the

Scribe', in *The Hidden Pearl*, ed. S.P. Brock, vol. 2, Rome 2001, p. 245; idem, 'Some Basic Annotations to *The Hidden Pearl: The Syrian Orthodox Church and Its Ancient Aramaic Heritage*, I–III (Rome, 2001)', *Hugoye: Journal of Syriac Studies*, 5/1 (2002), http://syrcom.cua.edu/Hugoye.

[52] Denis Muzerelle wrote about the problem of the degree of representativeness of Latin (not necessarily dated) manuscripts and, generally, of surviving historical artefacts, see D.M. [=Denis Muzerelle], 'De l'exhaustivité'*, Gazette du livre médiéval*, 1 (1982), pp. 15–17.

[53] On colophons, see below, chapter 2.

same scribe where a locality was indicated, or based on other sources.[54] Although this proportion is high and, in comparison with Latin manuscripts, even very high – it still presents a severe methodological challenge. The geo-cultural zone of half of the remaining manuscripts (some fifty one percent) was with absolute certainty or with some reservations, based on the script and the profile of typical codicological characteristics. Sometimes these identifications are utterly solid; when, for instance, we know of other manuscripts copied by the same scribe, containing an indication of locality in the same region, or when the region where the person commissioning the manuscript dwelt is known from other sources, or on the basis of the liturgical rite. And yet, the identification of the production zone of codices bearing no indication of locality merely on the basis of codicological traits and the script type characteristic of a certain region, may, at times, be mistaken. Thus, the employment of a considerable portion of the corpus of dated manuscripts for the identification of the production zone of an uncolophoned manuscript might be entrap us in the vicious circle of an assumption based on another assumption. This methodological trap can easily be avoided if we restrict the skeleton of our typology – at least at the first stage of identification – and deduct from it the non-localised manuscripts, with the exception of those which can be localised with certainty based on the kind of solid data described above.

Despite the limitations owing to the accidental and scant representativeness of the corpus of dated manuscripts vis-a-vis all the codices produced in the Middle Ages, we may confidently identify the provenance of a manuscript or estimate its date according to a codicological practice, when this practice is exclusive to a certain region or period; and we can even grant such a finding the status of a "rule", especially when the number of manuscripts which attest to it is large. Surely we are entitled to do so when such regional and chronological exclusiveness is found in shared combinations of codicological practices, and we can of course rely on such clear-cut data to establish the typology. Employing heuristic procedures of trial and error and of substitution and elimination when crosschecking practices and combinations thereof in the attempt to characterise manuscript populations and identify an individual manuscript could significantly minimise the limitations of the skeletal corpus of extant dated manuscripts.

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[54] Of course, there are significant differences in this respect between different production zones. In France and Germany, the percentage of colophons that include an indication of locality as well as a date is extremely low. See below, chapter 2, section 4.

In any event, it is only these manuscripts that are capable to assist us in systematically and accurately finding out that which might be uncovered from the multifaceted history of the medieval Hebrew book.

But above all, and beyond methodological problems, the elusive question for every scientific inquiry resounds loudly also in the world of general and Hebrew codicology – "why?" Why was the method of processing parchment in Germany and France totally transformed in mid-thirteenth century? Why was the method of ruling in Italy replaced in the 1420's? Why did a cursive script develop in Muslim countries much earlier than it developed in Christian lands? How did such similar scribal and bookmaking traditions become consolidated in such far-flung regions, under the uniquely individual circumstances of the production of the Hebrew book? Questions of this kind are probably the most enticing ones.[55]

4. Extant manuscripts, geo-cultural distribution of codicological practices and types of book-script

Findings of the surviving manuscripts
The number of Hebrew manuscripts and fragments that have survived since the mid- and late Middle Ages – from the beginning of the tenth century and until the end of the fifteenth century – may be as high as one-hundred thousand; this includes complete or partial codices, as well as many small codex fragments. The number of complete or partial manuscripts kept in hundreds of national, municipal, university, ecclesiastic, and private libraries[56] may be estimated as at least sixty thousand, if one counts each codicological unit separately in those cases where production units from different times and regions were bound together, as was commonly done with Hebrew codices in their various permutations over time. It is more difficult to estimate the number of remains of codices from among the many tens of thousands of fragments we possess, especially fragments from the great Geniza in the Ben Ezra synagogue of Fusṭāṭ (ancient Cairo),

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[55] I have addressed some of these questions and others and attempted to propose answers. See Beit-Arié, *Unveiled Faces*.

[56] A great deal of information about the collections of Hebrew manuscripts, their sources and their history, is found in the excellent guide by Benjamin Richler, *Hebrew Manuscript Collections*. See also the list of libraries and their addresses at the website of the Institute of Microfilmed Hebrew Manuscripts within the website of the National Library of Israel (http://web.nli.org.il/sites/NLI/Hebrew/collections/manuscripts/Pages/default.aspx), as well as Richler, *Hebrew Manuscripts*. A useful survey to date on the Hebrew collections and their sources is included in the general introduction to Hebrew manuscripts by Moritz Steinschneider, see Steinschneider, *Vorlesungen*, pp. 57-90.

and in other Genizas there and elsewhere, as well as fragments kept in European libraries (which to this day have only been partially uncovered and are now being brought to light in great numbers in several European countries, especially in Germany); such dismembered fragments were put into secondary use in the bindings of Latin manuscripts (several thousands of such fragments, which were used as soft covers for registers were discovered in Italian archives).[57] Clearly, the number of medieval literary fragments discovered to date (some three-hundred thousand) represents a smaller number of codices, since several, and sometimes many fragments originated from one codex which folios were often scattered among several libraries and only a particular study of this or that text would reveal their codicological affiliation. Quite a number of cases in which dispersed fragments were identified as deriving from the same codex suggest that it would be possible to surmise that the proportion of codices which remains are kept in Geniza collections may amount to around one sixth of the number of fragments; according to this rough estimate, which still requires statistical substantiation, their total number may reach around fifty thousand.

The estimated number of one hundred thousand medieval books and book remains which have survived since the ninth century represents, of course, only a small proportion of the manuscripts produced in that era.[58] The estimated number of book

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[57] There is a wealth of catalogues and research literature on these fragments. We refer here to the proceedings of a special conference dedicated to the 'Italian Genizah': *The Italian Genizah - Proceedings of the Conference held under the auspices of the Israel Academy of Sciences and Humanities and the Jewish National and University Library, Jerusalem, January 9, 1996*, ed. A. David & J. Tabory, Jerusalem 1998, and especially the article by Mauro Perani (who discovered most of the fragments in the Italian archives), 'Ha-geniza ha-Italqit – Te'ur kelali u-matsav hameḥqar' (in Hebrew) (ibid. pp. 83-93; a list of the previously published literature appears on p. 84, n. 2). The Hebrew articles in the above publication were translated into Italian and included in the collection La "Geniza italiana", ed. M. Perani (Alfa tape 12), Bologna 1999. Since then, additional catalogues of these fragments have been published.

[58] Colette Sirat attempted to estimate the number of manuscripts inscribed in the Middle Ages on the basis of literary evidence, book inventories, and demographic assessments of the size of Jewish communities, and arrived at an estimate of at least one million books. See C. Sirat, 'Les manuscrits en caractères hébraïques: Réalités d'hier et histoire d'aujourd'hui', *Scrittura e civiltà*, 10 (1986), pp. 260–271. Recent calculations have generated precise information on the number of shelf-marks of the fragments from the Fusṭāṭ Geniza and from other genizas and of the number of fragments they contain: the main concentration of Geniza fragments held at Cambridge University, yielded a count of 137,653 shelf-marks holding 192,848 bifolia or folio fragments, or 190,000, if the number of fragments that were not found in the Ben Ezra synagogue in Fusṭāṭ is subtracted from the total (these figures were provided by Rebecca J.W. Jefferson, formerly of the Geniza Unit in Cambridge). Continuously updated statistics on Geniza fragments is presented on the website of the Friedberg Genizah Project, which scanned almost all of the Geniza collections in the world (http://www.genizah.org). According to the data presented in August 2017, the number of shelf-marks of the 72 collections contained in the website amounts to 251,863 numbering 307,145 fragments. Thanks to the (ongoing) development of the experimental

remains kept in the Geniza at the synagogue of the Palestinian community in Fusṭāṭ – which was the source of most of the book remains estimated above – illustrates the high rates of production and book consumption among Jews in Islamic territories. From the years ca. 1000-1250,[59] which, according to the discovered dated documents was the main period in which books remains were deposited in this Geniza site – some two hundred and eighty thousand fragments survived. In other words, the members of one of the Jewish communities in Fusṭāṭ consumed and intensively used at least forty thousand books, until they wore out and were placed in a depository.

These data demonstrate the high level of literacy in Jewish society,[60] and furthermore indicate that the amount of wear and tear Hebrew books underwent due to intensive use, as well as the conspicuously individual character of their production, consumption, and preservation (as will be shown below), were the prime causes for the loss of most of the manuscripts during the Middle Ages. It is quite probable that even more than the ravages of nature and time, or the confiscations, looting and even burning of books in

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software for this project, which may enable fragments deriving from the same codex to be automatically located (alongside manual verification of the matches by experts), it will be perhaps possible to produce more accurate estimates of the number of codices whose remains were preserved in the Fusṭāṭ Geniza and in other genizas. See A. Shweka, Y. Choeka, L. Wolf, and N. Dershowitz, 'Automatic Computerized Identification of Handwriting and Matching of Genizah Fragments', *Ginzei Qedem*, 7, (2011), pp. 173-209.). For a comprehensive description of the software, see L. Wolf, N. Dershowitz, L. Potikha, T. German, R. Shweka & Y. Choueka, 'Automatic Palaeographic Exploration of Genizah Manuscripts', in *Kodikologie und Paläographie im Digitalen Zeitalter / Codicology and Palaeography in the Digital Age* 2, ed. F. Fischer, Ch. Fritze & G. Vogeler (Schriften des Instituts für Dokumentologie und Editorik 3), Norderstedt: Books on Demand, 2010, pp. 157–179. One should keep in mind that not all fragments associated with the 'Cairo Geniza' derive from the Ben Ezra synagogue in Fusṭāṭ, as does the main collection at Cambridge University. Some come from other, mostly Karaite, genizas in the Orient, especially those concentrated at the Dār Simḥa synagogue in Cairo. See the recent discussion, H. Ben-Shammai, 'Is "the Cairo Genizah" a Proper Name or a Generic Noun? – On the Relationship between the Genizot of the Ben Ezra and Dār Simḥa', in *'From a Sacred Source': Genizah Studies in Honour of Professor Stefan C. Reif*, ed. B. Outhwaite & S. Bhayro, Leiden–Boston 2011, pp. 43–52. Of the total number of shelf marks or fragments from all of the genizas one should subtract some twenty-thousand documents, and at least twenty-five thousand reused fragments discovered in European libraries and archives should be added to it.

[59] According to Goitein, (Goitein, *Mediterranean Society*, vol. 1, 1967, p. 18) the Geniza contains an uninterrupted continuum of documents from 1002 through 1266.

[60] See Assaf's voluminous anthology, Assaf, *Mekorot*. For education in the Middle East, see the book by S.D. Goitein, *Jewish Education in Muslim Countries*, Jerusalem 1962 (in Hebrew). The reader will find interest in the recent studies by Botticini and Eckstein, who have examined from an economic perspective the long-term influence on Jewish history of the establishment of literacy as a religious norm in the 1st century C.E. in Palestine. See M. Botticini & Z. Eckstein, 'Jewish Occupational Selection: Education, Restrictions, or Minorities?', *Journal of Economic History*, 65/4 (December 2005), pp. 922–948; idem, 'From Farmers to Merchants, Conversions and Diaspora: Human Capital and Jewish History', *Journal of the European Economic Association*, 5/5 (September 2007), pp. 885–926.

Christian Europe,[61] the constant use of the books was the factor responsible for this loss. In short, it stands to reason that the profuse use of books, the individual nature of their production and maintenance, their destruction in Christian lands as well as the historical fate of the Jewish people, doomed to persecutory decrees, expulsions and wandering, all contributed to the low survival rates of Hebrew manuscripts in comparison with that of Latin, Greek or Arabic ones.[62]

In truth, the discussion on survival rates of Hebrew books should also touch upon the quantification, classification and analysis of the textual genres that survived, as well as on the detailed and comparative surveying of the copying of the surviving texts in different areas and periods. The collection of such data could have far-reaching

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[61] For the confiscation and burning of Hebrew books (especially Talmuds) in Europe, see Popper's overview of censorship of Hebrew books: W. Popper, *The Censorship of Hebrew Books*, New York 1899 (rep. New York 1968), chaps. 1–5. The scarcity of books, and the resulting obligation to lend them out, is apparent in a responsum by Rabbi Asher ben Yeḥi'el (also known as HaRosh, b. Germany 1250 – d. Spain 1328; most of his responses were composed in Spain): ושאלת על דיין שדן על מי שיש לו ספר ואינו רוצה להשאילו ונתן עליו קנס – עשרה זהובים בכל יום מפני שהיה ביטול תורה בעיר מחמת חסרון ספרים בעיר והיו אנשים שהיו להם ספרים ולא רצו להשאילם – יפה דן ואני מסכים עמו (She'elot u-teshuvot le-ha-Rav Rabenu Asher, Venice 1552, Kelal 93, par, 3, fol. 136r. In this context, the statements made by the twelfth-century scholar Yehuda Ibn Tibbon – who had emigrated to Provence – in the ethical will he left to his son Shemu'el are instructive, testifying both to the wealth of manuscripts in his private library and to their rarity, as well as to their lending and his library practices. Ibn Tibbon notes that he saw to his son's library and supplied it even with multiple copies of the same work: 'I have honored thee by providing an extensive library for thy use, and have thus relieved thee of the necessity to borrow books. Most students must bustle about to seek books, often without finding them. But thou, thanks be to God, lendest and borrowest not' (translated by Abrahams, *Ethical Wills*, p. 57); 'Never refuse to lend books to anyone who has not the means to purchase books for himself, but only act thus to those who can be trusted to return the volumes. <…> If thou lendest a volume make a memorandum before it leaves thy house, and when it is returned, draw thy pen over the entry. Every Passover and Tabernacles call in all books out on loan' (ibid., pp. 81-82).

The rarity of books is also attested to in the many passages in *Sefer Ḥasidim* urging people to lend books and praising the lenders, e.g. passages 669, 672-778, and 745 (p. 189). On the scarcity of books after the Spanish expulsion and during the early print era, see the long colophon of a Pentateuch with Rashi's commentary, *Haftarot* with a commentary by David Kimḥi, and the Five Scrolls with a commentary by Avraham Ibn Ezra, Constantinople 1505-1506, printed by David and Shemu'el ibn Naḥmias (no doubt the colophon had been inscribed by Avraham ben Yosef ben Ya'ish, the book's proofreader): והנשארים שנים שלשה גרגרים <...> גם הספרים ספו תמו מבלהות השמדות ומבוכי ההפכות <...> עד שבסבת טרדות הזמן וחסרון הספרים יתרשלו האנשים בלימוד בניהם, שאף אם ימצא בידם החומש לא ימצא התרגום, וכשימצא התרגום לא ימצאו הפירוש <...> שני אחים מחוקקים <...> וישא לבם אותם להפריץ ולהרחיב תורה בישראל להחליף קצת תמורת מה שנתך ונפסד בין בים בין ביבשה מהספרים אשר לא יכילם מספרי (for the full text of the colophon, see A. Yaari, Hebrew Printing at Constantinople; its History and Bibliography, Jerusalem 1967, p. 60 [in Hebrew]).

[62] Six hundred thousand is a rough, minimalist estimate of the number of surviving Arabic manuscripts. See A. Gacek, 'Some Remarks on the Cataloguing of Arabic Manuscripts', *British Society for Middle Eastern Studies*, 11 (1984), p. 173; however, according to the comprehensive documentation in the libraries housing Islamic manuscripts (with the exception of private collections), their number amounts to two and a half million; see *World Survey of Islamic Manuscripts*, vols. 1–4, London: Al-Furkan Foundation, 1992–1994.

consequences for our knowledge about the reception, circulation, and rates of use of texts, even though the survival of texts must have been accidental and linked to historical circumstances, such as the burning of the Talmud, pogroms, and expulsions. Such a survey would probably allow us to assess which texts and moreover which book patterns, book materials, quality and material value were to affect the very survival of a book at at certain time and place. Such an ambitious undertaking would require tremendous resources to allow the processing of the contents of tens of thousands manuscripts that survived in their entirety or in fragments and of their material attributes. Indeed, the online catalogue of the Institute of Microfilmed Hebrew Manuscripts in the National Library in Jerusalem, which contains a very large proportion of microfilms of all the extant Hebrew manuscripts in the world, could greatly assist such a survey, as could other online catalogues of more specific corpora. Despite the accidental nature of the survival of manuscripts, and even more so of colophoned dated manuscripts, the information about regional and chronological distribution according to genres, easily retrievable from Hebrew Palaeography Project's *SfarData* online database, would have significant, albeit circumscribed, value.

Table 4: Geo-cultural distribution of genres of manuscripts dated before 1540

For the basis of the statistical calculations in this book, see the Introduction below, in the section of 'General statistics of the database' (preceding Table 5).

(1) Bible: text (2) Bible: Commentary (3) Halakha & Midrash (4) Prayer books & Maḥzorim (5) Science

(6) Grammars & Lexicons (7) Philosophy & Kabbala (8) Literature & Poetry (9) miscellanies

number of codices   % percentage out of the regional corpus

Zone	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	5 #	5 %	6 #	6 %	7 #	7 %	8 #	8 %	9 #	9 %	Total in Corpus
Sefarad	106	18	85	14	134	22	19	3	79	13	36	6	153	26	10	2	8	1	598
Ashkenaz	74	20	27	7	160	44	63	17	8	2	16	4	33	9	1	0	5	1	361
Italy	76	8	174	18	192	19	144	15	112	11	53	5	244	25	21	2	31	3	989
Byzantium	7	3	59	21	66	24	5	2	42	15	16	6	88	32	10	4	31	11	276
Orient	41	10	102	26	123	31	27	7	12	3	31	8	44	11	13	3	2	1	398
Yemen	31	24	5	4	77	60	3	2	3	2	16	12	4	3	0	0	2	2	129
Unidentified	2	8	7	27	7	27	0	0	1	4	1	4	8	31	0	0	2	8	26
Total	337	12	459	17	759	27	261	9	257	9	169	6	574	21	55	2	81	2	2777

What is the date of the earliest surviving dated Hebrew codex? In the middle of the twentieth century it was believed by many that a manuscript of the Prophets, copied in Tiberias by Moshe ben Asher, of the famous family of Masoretes, was the most ancient.[63] According to the long and florid colophon at its end (p. 575) this decorated manuscript, kept in the Karaite Moussa Darʻi synagogue in Cairo, was completed 'eight-hundred and twenty seven years after the destruction of the Second Temple', namely in 894/5. However, a few scholars have doubted the authenticity of the colophon, on the basis of the Masora version and vocalization, which diverge from the Ben Asher tradition, as well as on the basis of codicological considerations, as the codicological characteristics of the manuscript suggest it had been manufactured some one hundred years later. Indeed, radiocarbon (Carbon 14) dating of a parchment

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[63] Noted also in Beit-Arié, *Hebrew Codicology*, p. 9.

fragment from the manuscript body showed that the parchment was manufactured not before 990, and therefore the manuscript should be dated at around 1000.[64]

The earliest dated manuscript which date is not in doubt was inscribed in Iran in the year 903/4. From this miniature biblical codex, whose width exceeds its length,[65] only seven damaged folios, containing portions of the books of Ruth and Nehemiah with supralinear Babylonian vocalization, have survived in the Fusṭāṭ Geniza, yet the original codex may have included the entire Hagiographa.[66] According to the colophon, it was copied by Yosef ben Nemorad in Gombad e-Malagan (גומביד ימלגאן), and since this very brief colophon mentions nothing about the destination of the copy one can assume that he had copied it for himself. As just mentioned, this fragment – produced in the Orient - is the earliest extant dated manuscript from any region; like the Moshe ben Asher codex, which dating has been discredited, it, too, includes an explicit indication of locality. The next-to-earliest extant manuscript was completed in the month of Tishrei in the year 1228 of the era known as *minyan shetarot* (equivalent to the Seleucid Era), i.e. 916 – MS St. Petersburg I B 3. This biblical manuscript too was written in the Middle East and it also features the Babylonian vocalization. Unlike its predecessor it was preserved in its entirety.[67]

A few Oriental manuscripts (as well as documents) contain dates of copying or transfer of ownership that are prior to the tenth century, but these dates are certainly unreliable. Sometimes the date indicated in the colophon would clearly be forged, and sometimes an entire colophon with an unusually early date would be inserted at a later period. Similarly, early dates describing a manuscript's history, such as its sale or its ownership, providing a *terminus ante quem* for its manufacture, have often been found to be unreliable.[68]

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[64] For a detailed description of the Cairo manuscript, along with plates and a discussion of the reservations about its dating, including the results of the testing of the parchment, see *Codices hebraicis*, Part I, Manuscrit 1.

[65] 117x127 mm, folio proportions known as 'oblong'.

[66] Beneath the colophon and around it the Masoretic summary notes concluding the Hagiographa have survived. For the details of the manuscript fragments, all kept at the library of Cambridge University, their codicological description, as well as true-to-size photographic plates, see *Codices hebraicis* Part I, ms. 2.

[67] See in detail, *Codices hebraicis*, Part I, Manuscrit 3.

[68] An example of a forged colophon is that of MS Cambridge Mm 5.27 – a Sefardic Bible, apparently from the 14th century: the colophon indicates the date as התור״ה ליצירה. Despite the reservations voiced about the attributed early date of this codex, Schiller-Szinessy, author of the catalogue of Hebrew manuscripts kept in the University Library, did not hesitate to compute the date as [four thousand] תרט״ז

As noted in section 3 above, it is highly probable that small or large fragments of Hebrew codices produced in the Middle East before the tenth century survived in the

(856), and to assume that it was authentic (see S.M. Schiller-Szinessy, *Catalogue of Hebrew Manuscripts Preserved in the University Librar*y, vol. 1, Cambridge 1876, pp. 12–15, no. 12). However, the manuscript's visual appearance reveals that it dates from much later and, what's more, that a second hand had clearly intervened in the colophon. Furthermore, the gematria (the numerical value of the letters) of the date התור״ה ליצירה should apparently be calculated as היתרי״א (1851!), in the manner of sixth-millennium scribes, who used to select words beginning with the Hebrew letter *he* (הי״א) to designate the millennium (see *Manuscrits médiévaux* I, 117, n. 1 ; and also S. Hopkins, 'The Oldest Dated Document in the Geniza?', in *Studies in Judaism and Islam Presented to Shlomo Dov Goitein on the Occasion of his Eightieth Birthday*, ed. S. Morag, I. Ben-Ami & N.A. Stilman, Jerusalem 1981, p. 84).

An example of an unreliable date in a document is found in a divorce act (*get*) written, so it seems, in 748/9 in 'Pumbedita', Babylonia (a photo plate of the document was printed in Encyclopaedia Judaica, vol. 6, col. 124). This *get*, which was privately owned, has in the meantime been transferred to the library of the Center for Advanced Jewish Studies at the University of Pennsylvania in Philadelphia, and Prof. David Goldenberg had submitted it for radiocarbon dating. The Carbon-14 test, which validated the doubts of palaeographers as to the reliability of the early dating, has verified that it was a forgery indeed and that its earliest possible date was 1660. See D.M. Goldenberg, 'Notes on the Library of Annenberg Institute', *JQR*, 82 (1992), pp. 483–484.

An example of the disqualifying of a 9th-century (and allegedly even earlier) dating based on a record of ownership transfer: the unreliable date of Marḥeshvan 4608 (847), noted in a sale deed in a manuscript of Minor Prophets, MS St. Petersburg, Oriental Institute D62 (formerly from the Chwolson collection), and known already in the latter quarter of the 19th century. For a description of the manuscript see C.B. Starkova, 'Les plus anciens manuscrits de la Bible dans la collection de l'lnstitut des Études Orientales dl'Académie des Sciences de I'U.R.S.S.', in *La paléographie hébraïque médiévale* (Colloques internationaux du Centre National de la Recherche Scientifique 547), Paris 1974, pp. 38–39 and pl. VIII (where the date was erroneously noted as 747 instead of 847). The date of sale of the manuscript, known in the 19th century as Codex Karasubazar, provoked debates among scholars during the latter quarter of the 19th century. Avraham Harkavy already doubted the reliability of this annotation while Daniel Chwolson believed it was genuine. See Chowlson, *Corpus inscriptionum*, columns 184-196 (and the earlier discussions cited there), as well as lithographs 99-100; E. Deinard, *Masa Krim*, Warsaw 1878, p. 24-27 (in Hebrew). For the problematic nature of this dating in terms of the Hebrew calendar, see H. Y. Bornstein 'Divrei yemei ha'ibbur ha-'aḥronim', *HaTequfa*, 14-16 (1922), p. 354 (in Hebrew). For the impossibility of ascribing the vocalization, cantillation, and Masora of this manuscript to such an early period, see I. Yeivin, *The Aleppo Codex of the Bible: a Study of its Vocalization and Accentuation*, Jerusalem 1968 (Publications of the HUBP, Monograph series 3), p. 371 (in Hebrew). From an examination of the manuscript itself, and even of the lithographs in Chowlson's book, and more clearly from a colour scan sent to me recently by Shimon Iakerson it is clear that the deed of transfer of ownership at the end of the manuscript has two parts. The upper one is in a skilful Oriental semi-square script, the authenticity of which cannot be denied, yet it contains no date and reads: וזה מספר ישעיה ירמיה יחזקאל ותנ]ן[ר]ן[י עשר נפל בידו של סעיד בן עיב]ט] הגדול]?< מנחלת אביו כחלק >...< אשר ל>...< כל האחים >...< איש חלקו >...< - with the addition of witnesses' signatures. Underneath, the dated inscription in coarser script was added later, some of its letters blurred, presumably with the intention of making it difficult to decipher. This appears to be another of the forged colophons from the Firkowicz collections. See recently the extensive article by S. Iakerson, 'The Karasubazar Codex of the Later Prophets from the Collection of the Institute of Oriental Manuscripts (D 62)', in *Manuscrits hébreux et arabes: Mélanges en I'honneur de Colette Sirat* (Bibliologia 38), ed. J. Olszowy-Schlanger & N. De Lange, Turhout 2014, pp. 63-76. For other examples of all types, see my Hebrew introduction to *Codices hebraicis*, Part I, p. 13-14.

Egyptian Genizot. This is indicated by the shapes of letters and script styles in these fragments,[69] and, moreover, by the lack of the scribe's graphic interventions designed to make transparent the hierarchical structure of the text and of its units (such interventions were witnessed only later).[70] Yet most of all it is indicated by the earliest dated manuscripts themselves. As pointed out, these display a mature and elaborate bookcraft, crystallised design patterns and a harmonious script, undoubtedly attesting to a prior tradition of codex production in the Middle East. We do not know how many decades had elapsed before this crystallisation, yet we may perhaps speculate that at least a century must have gone by before this tradition developed to achieve this level of craftsmanship, and hence to assume that Oriental bookcraft crystallised over the course of the ninth century.

Among the extant manuscripts dated up to 1540 – numbering some 3,000 codices which contain around 3,400 codicological-palaeographic units, almost all of them documented – which provide the backbone for the typology presented in this work, the number of manuscripts produced before the middle of the thirteenth century is low and amounts to no more than two hundred and two. This small number makes it difficult, of course, to expose the early traditions of Hebrew bookcraft, although some of the codicological features observed in these manuscripts in various regions were found to characterise later manuscripts that survived in larger numbers; this fact lends greater validity to the scant testimonies from the earlier period. From the period before 1000, only twelve dated manuscripts survive – all of them biblical codices inscribed on parchment and surely produced in the Middle East,[71] just as most (some two-thirds) of

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[69] See e.g. the facsimile plates from one of the palimpsests (see above, n. 19) shown in Taylor's book, C. Taylor, *Hebrew-Greek Cairo Genizah Palimpsests from the Taylor-Schechter Collection*, Cambridge 1900. For the hypotheses of textual scholars regarding the dating of the palimpsests, see J. Sussman, 'A Halakhic Inscription from the Beth-Shean Valley', *Tarbiz*, 53 (1974), pp. 155-156, n. 497.

[70] See below, chapter 8.

[71] *Codices hebraicis*, Part I, mss. 1-13. Despite the conspicuous difference between the survival rates of Latin manuscripts before 900 and the non-survival (or inexistence) of Hebrew codices during the same period, it is interesting that the chronological distribution of the survival rates of dated Latin manuscripts is quite similar to that of dated manuscripts in Hebrew script; this, too, is an indication to the problems arising from the scarceness of early manuscripts. Of 11,700 dated manuscripts in Latin script which were included in the series of dated manuscripts published in various European countries before 1983, only a quarter were dated before 1440, and only 909 of these (i.e. 8%) were dated before 1200. See M-C. Garand, 'Le catalogue des manuscrits datés: Histoire de l'entreprise', in *Les manuscrits datés: Premier bilan et perspectives*, ed. G. Grand et al., Paris 1985, pp. 1–5. See also the calculations performed by B. Von Scarpatetti for this corpus, according to which only 15% of the mentioned manuscripts are dated prior to 1300 (ibid., pp. 59-64). Indeed, the ratio of dated Hebrew manuscripts prior to 1200 in relation

the surviving manuscripts up until 1250 were produced in this same region, which was the cradle of the Hebrew codex. The regional deployment of the production zones of extant manuscripts had been gradually expanding already during the eleventh century (and perhaps even during the tenth). One biblical codex was inscribed, as indicated in its damaged colophon, by four scribes and four Masoretes, between the years 941 and 1039 in Kirouan, Tunisia;[72] that city was the main centre of learning in North Africa and no doubt functioned as a source of influence for biblical codex production in Spain. This manuscript is of crucial importance for our knowledge of the early stages of the crystallisation of Maghrebi-Iberian bookcraft and scripts; moreover, a number of manuscripts produced in the Middle East already at the turn of the tenth century and the beginning of the eleventh century by immigrant scribes from North Africa (surely from Tunisia) and from Spain disclose a number of the codicological characteristics that are typical of the Kairouan codex, and especially of the later Sefardic manuscripts.[73] From the latter quarter of the eleventh century, there have survived the two earliest codices produced on the European continent, no doubt in Italy. It seems that the earlier of the two had been inscribed in 1072/3 in Otranto, in the region of Puglia in the south of Byzantine Italy,[74] while the other was copied by a group of seven copyists in the year 1090/1.[75]

Surviving manuscripts from the twelfth century have considerably extended the geographical range of Hebrew book production as well as our understanding of its character. The earliest extant dated manuscripts produced in Spain, in areas of Germany and France, and in Byzantium date from this same century, especially from its latter quarter. From Spain, there has survived a fragmented paper manuscript in Judaeo-Arabic of the works of the grammarian Yona Ibn Janāḥ, copied in 1119 in Valencia

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to all the dated manuscripts before 1500 is of 5%; their ratio until 1300 is 16%; and before 1400 their ratio is greater than that of Latin manuscripts and is as high as 41%!

[72] MS St. Petersburg Евр. II B 124. The colophon of the codex, the earliest to have certainly been produced outside of the Middle East, was damaged and treated with a dark colour. In the notation of the date only the thousands (5) and the hundreds (8) can be read without doubt, and therefore the date can be delimited to the period between 941 and 1039. It follows that the possibility that the codex had been copied as early as the 10th century cannot be ruled out. For a detailed description of the manuscript, see C*odices hebraicis*, Part II, Manuscrit 29.

[73] See also *Codices hebraicis*, Part I, mss. 12, 13, and the introduction, p. 15; Part II, mss. 19, 23, and the introduction, p. 15.

[74] MS Vatican Vat. ebr. 31

[75] *Codices hebraicis*, Part III Manuscrit 43.

when it was still under Muslim rule.[76] Especially impressive in terms of their codicological maturity, design, and scripts are the earliest extant manuscripts from regions of Christian Europe north of the Pyrenees and the Alps – four codices that were produced in the brief period between 1177 and 1193, in the zones of Germany, France, and England. The earliest dated manuscript from the Franco-German zone, completed in 1177, is a volume containing the tractates of the Babylonian Talmud and kept in the Biblioteca Nazionale Centrale in Florence.[77] From the end of the twelfth century (1192) we also find a fragment of the earliest dated manuscript produced in the Byzantine zone, most probably in Greece.[78]

In what regards the Middle Eastern zone, a manuscript copied in 1144 in Yemen (Aden) has survived[79] and is, accordingly, the earliest extant manuscript from this region; later books produced in this same area display a unique profile in the context of Oriental book and script traditions.

From the middle of the thirteenth century and onwards, we encounter growing numbers of dated (and localised) manuscripts which have survived from all the regions; these provide a plethora of data about Hebrew bookcraft and design and about the book-scripts and script types in the zones of Hebrew book production along the centuries (see below in the section on the general statistics of the database, tables 6-9). The production zones of codices in Hebrew script were extremely widespread, for they accorded with the broad spread of Jewish communities in the mid- and late Middle Ages. From the ninth century onward, Jews adhered to the Hebrew script and used it throughout their

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[76] MS St. Petersburg Евр.-Араб. I 2440; See *Codices hebraicis*, Part III, Manuscrit 57.

[77] See *Codices hebraicis*, Part IV, Manuscrit 79. See ibid. the description of the other three manuscripts – ms. 84 which includes lexicographic works from 1188/9; ms. 85 containing the Pentateuch, Five Scrolls, and *Haftarot*, from 1189; and ms. 91 containing Prophets and Hagiographa, from 1193. None of them indicate the place of production in their colophon, just as in subsequent periods manuscripts from these zones would bear few indications of locality, unlike the abundant use of such indications in the other zones (see below, chapter 2, at the beginning of section 4). Only ms. 85 allows us to surmise a more precise provenance with a considerable degree of likelihood, and to deduce from its textual and codicological data that it was almost certainly produced in England, to which Jewish residents had arrived from Normandy after the Norman Conquest. The style of the script in ms. 84 suggests that it had been copied in France.

[78] MS Oxford MS. Heb. c. 6 (Neubauer & Cowley Catalogue 2616/4). See *Codices hebraicis*, Part IV, Manuscrit 89.

[79] *Codices hebraicis*, Part IV, Manuscrit 70.

diasporas for all their needs, be they literary or practical.[80] Even when they adopted the languages of the host societies – prominently so in the Islamic territories, where a considerable portion of the literary texts were inscribed in Judaeo-Arabic – these languages were always rendered in transliteration, by means of the Hebrew alphabet.[81] In terms of the geographical spread of scripts used in the Middle Ages, the spread of the Hebrew script was greater than that of the Greek, Latin, or even Arabic scripts, since Hebrew writing was used in all of the zones in which other scripts were employed. Hebrew manuscripts were produced and consumed from central Asia in the east to England, far in the west, from Yemen and North Africa in the south to the German lands in the north; in the zones of Christian civilisation which employed the Latin script, of Muslim civilisation in the Occident and Orient, where the Arabic script was used, and in those of the Christian Byzantine civilisation which used the Greek script. The production of Hebrew codices could not have escaped the influence of the codicological traditions and design and of the writing styles that were in use in the host societies in which Jews resided. Various features pertaining to various areas were borrowed and adopted unmodified by Jewish scribes, while other traits were totally rejected, or resisted for a long time. In any event, because of the great dispersal of their production sites, Hebrew manuscripts resemble manuscripts of their respective Gentile environments in terms of appearance, script style, the nature of the writing materials, production techniques, and the configuration of the text, more closely than they do Hebrew manuscripts produced in other geo-cultural zones: Similarities with the latter seem to have been reduced mainly to the actual use of Hebrew scripts and texts. It should be stressed that the commonality of production and design modes does not necessarily attest to direct borrowing or influences, or to the Jewish minority's acculturation in the Gentile society. Writing materials, for instance, depend on the

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[80] Until that time most of the extant inscriptions (mostly gravestones and funerary ones) were found outside of the Middle East and were inscribed chiefly in Greek. See J.B. Frey, *Corpus Inscriptionum Iudaicarum*, vols. 1–2, Vatican City 1936–1952 (a new edition of the corpus of inscriptions in the first volume has been published by Lifshitz, accompanied by an extensive and useful introduction: B.L. Lifshitz, *Corpus of Jewish Inscriptions: Jewish Inscriptions from the Third Century B.C. to the Seventh Century A.D.*, New York 1975); A. Fuchs, *Corpus Papyrorum Judaicorum*, vols. 1–3, Cambridge, Mass. 1957–1964.

[81] Apart from a few examples of inscriptions in Latin script in Europe, the employment of a non-Hebrew script was unique only to certain Karaite circles during the 10th and 11th century; those employed the Arabic script for composing their writings, and even transliterated biblical verses using this script, perhaps as a confrontational tactic or out of a desire to proclaim their distance from Rabbinical Judaism. See Beit-Arié, *East and West*, pp. 6-7, and the literature cited there, ibid. p. 105, n. 12.

supply available in the marketplace to members of both the majority and minority societies. Style and aesthetic principles are often an outcome of the *zeitgeist*, of which the minority also partakes, and thus they may imbue its products even in the absence of direct contact with the dominant majority.

Branches and main types of codicological traditions and script styles

The codicological traditions and script styles of Hebrew manuscripts may be classified into two main branches: the branch of manuscripts produced in the Islamic lands, which were greatly influenced by Arabic booklore and Arabic scripts and calligraphy; and the branch of manuscripts produced in the lands of Western Christianity, which were influenced to some measure by Latin bookcraft and scripts. Alongside these two main branches, a third, smaller one should be mentioned – that of manuscripts produced in Byzantium, which, presumably, were influenced by Greek bookcraft and script.[82] The manuscripts of this branch display hybrid influences of both main branches, reflecting their location between Occident and Orient.

The branch that developed within the regions of Islamic civilisation is divisible into two sub-branches – Eastern and Western. The Eastern sub-branch was consolidated, of course, before its Western counterpart (and before the other branches) and was a source of influence for the latter. It encompassed the countries of the Middle East, neighbouring areas in West-Central Asia, and East Asia Minor, areas which during the time of the earliest codices formed part of a single political entity of the Abbasid Caliphate. The Western sub-branch of the Islamic lands included the Maghreb, Muslim Spain in its extended borders at the time of the consolidation of Sefardic book culture, circa 1000, and Sicily, which was under Muslim rule. Despite the similarities between the scripts of the Western and Eastern sub-branches, the bookmaking practices of the Western sub-branch differ from those of the Eastern sub-branch in almost every aspect. The branch of Western Christianity regions is also divided into two sub-branches – that of the areas west and north of the Alps, including France (except for southern France), England and the German lands, and that of the area extending south of the Alps (Italy).

Five main types of bookcraft and script

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[82] For a detailed survey of the branches of script types and their codicological characteristics see Beit-Arié, *East and West*, pp. 25-78.

The dated manuscripts can be classified according to their codicoligical characteristics and their script styles into five main types, as detailed below. These independent codicological entities are defined by geographical and cultural boundaries, not necessarily political ones. We shall formulate their definitions in geo-cultural terms which will be used to designate chief production zones, while the deriving adjectives will be used to designate the script type and codicological type. This typological division is synchronic and reflects the appearance of the types after their consolidation and diffusion; it is thus suitable for describing periods that have yielded an abundance of surviving witnesses. Unavoidably, because of its complexity and stage-by-stage development, the dynamic 'Sefardic' type must be presented individually and diachronically, and this is also the case in respect to the 'Italian' codicological type.

[1] **Orient**, **Oriental** – the bookcraft and script type practiced in the regions of the Middle East[83] (Egypt, Palestine, Syria, and Lebanon), East Asia Minor (East Turkey), Iraq, Iran, and areas in central Asia, such as Uzbekistan, Bukhara and Afghanistan.

Within the boundaries of this codicological entity, our observations to date allow us to single out two regional sub-types that took form after some time:

Yemen, Yemenite – The manuscripts produced in the southern Arabian Peninsula stand out for their unique script style, as well as their technical traits and overall design, at least from the end of the thirteenth century. Their uniqueness vis-à-vis the other Oriental manuscripts justifies their classification as a separate and independent type.

Persia, Persian – Manuscripts copied in Iran and its environs (Uzbekistan, Bukhara) reflect, at least from the early-fourteenth century onwards, a script style, quiring practices, and use of a local paper with a unique morphology. Unlike the Yemenite manuscripts, their special characteristics and small number do not warrant the establishment of a Persian sub-type in the typological classification, but, where relevant, their unique characteristics will be pointed out.

[2] **Sefarad, Sefardic** – This geo-cultural and typological term encompasses not only the manuscripts produced on the Iberian peninsula – both within the extended borders of Muslim Spain before the Christian *reconquista*, and within Christian Spain – but also

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[83] Alternatively, perhaps the other term – Near East – could be used, although the difference between the two is now obscured.

those produced in North Africa (Tunisia, Morocco, Algeria) and in Sicily, which was under Muslim rule. Moreover, the term also includes manuscripts produced in adjacent areas that were under continuous Christian rule beyond the Pyrenees – Provence and Bas-Languedoc (Occitania) in southern France.

The Sefardic codicological type was witnessed in the Iberian peninsula since the end of the twelfth century and until the expulsion of the Jews in 1492. It combines the characteristics of the Hebrew bookcraft of northern Spain, which was under Christian rule since the consolidation of the Hebrew codex, exposed continuously to Latin bookcraft (especially in Catalonia and the Kingdom of Aragon), and those which prevailed further south, in territories that were under Muslim rule when Hebrew bookcraft was taking shape, immersed in Arabic book culture. There are no surviving manuscripts with explicit indications of their place of production in Christian Spain prior to the beginning of the *Reconquista*. The earliest manuscript produced there was copied in 1184 in Girona, northern Catalonia,[84] when the recapture of the peninsula by Christian rulers was already almost completed. Thus there is no way of knowing whether the Sefardic type known to us from manuscripts from the end of the twelfth century and onwards was also characteristic of Christian Spain before the *Reconquista*. Similarly, we have no way of knowing whether this fully crystallised type was characteristic of Muslim Spain. The earliest manuscript from Iberia – copied in 1119 in Muslim Valencia, some 120 years before it was finally retaken by the Christians[85] - was a fragmented paper manuscript containing only scant codicological data. This said, no other manuscript with an indication of locality survived from Muslim Spain before the *Reconquista* (with the exception of a few late manuscripts copied in Granada, which remained under Muslim rule almost until the expulsion).

And yet, there are several reasons to suppose that the pan-Iberian Sefardic codicological type originated in Andalusia (in Al-Andalus), namely in Muslim Spain, while in northern, Christian Spain a different bookcraft had prevailed till the start of the *Reconquista* (in the late eleventh century). This supposition relies on the fact that

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[84] MS Hamburg Cod. Hebr. 19, the famous manuscript of the three 'gates' (בבות) of the Babylonian Talmud, see *Codices hebraicis*, Part IV, Manuscrit 81.

[85] The earliest codex bearing an indication of locality that was produced in Muslim Spain, after the fragmented paper manuscript inscribed in Judaeo-Arabic in Valencia (above, n. 76) was copied in Toledo in 1197/8, around one-hundred years after its conquest by the Christians (See *Codices hebraicis*, Part IV, Manuscrit 95).

codicological traits characteristic of and unique to the Sefardic type, as reflected in the many testimonies of later manuscripts produced in the northern and southern Iberian peninsula after the Christian *Reconquista*, were visible already in the earlier tenth- and eleventh century manuscripts produced in Tunisia and in the Middle East by immigrants from the Maghreb.[86] Accordingly, one might assume that the roots of Iberian bookcraft were in North Africa – especially in Tunisia and in the Tora centre in Kairouan.[87] Nonetheless, the fact that early manuscripts produced in the Maghreb. or by immigrants from the Maghreb in the Near East, had survived in greater numbers than those produced in the Iberian Peninsula might be a mere accident; Hence we should not readily reach the conclusion that the origin of Iberian bookcraft was indeed in the Maghreb. Yet, it is less logical to suppose that the Maghrebi bookcraft originated in Spain merely on the basis of evidence that immigrants from Spain had settled in the Maghreb during the ninth century.[88] If the codicological tradition of the Muslim Maghreb was a source of inspiration and borrowing for book producers in Al-Andalus, it certainly could not have been a source of inspiration for the scribes in Christian Spain before the reconquest. Át any rate, if Maghrebi bookcraft was adopted by scribes in Muslim Spain, it was greatly enhanced in Andalusia. The intellectual and economic efflorescence witnessed in Spain, as opposed to the impoverishment of the North African communities, has made Spain the chief representative of this codicological type, apparently rooted in the Maghreb.

Furthermore, we have evidence indicating that the non-square scripts – semi-cursive or cursive – which were employed in Christian Spain before the first *Reconquista* or during its first stages in the eleventh century were unlike the semi-cursive or cursive scripts known from documents or drafts from Muslim Spain, or from the book-script of the earliest manuscript from Muslim Spain dated 1119. Bilingual documents in Latin and Hebrew – deeds of transfers of property and the like – inscribed in Catalonia (especially in Barcelona) from 1000 onwards, clearly attest that the style of the Hebrew

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[86] For the manuscript copied in Tunisia (most likely in Kairouan), see above in the references to notes 72 and 73, and in the notes themselves. These witnesses can be joined by MS Oxford MS. Heb. b.1 (Neubauer & Cowley Catalogue 2673/8), a fragmented manuscript of the Talmud copied in 1123, probably in North Africa (See *Codices hebraicis*, Part III, Manuscrit 63).

[87] One can also assume that Maghrebi bookcraft had initially been an offshoot of the earlier Oriental type, as attested by the resemblance of their square scripts, but at an early stage it adopted utterly different practices and separated from the Oriental tradition.

[88] See M. Ben-Sasson, The Emergence of the Local Jewish Community in the Muslim World: Qayrawan, 800-1057, Jerusalem 1996, (in Hebrew), p. 38c.

script employed in them resembles the style of the cursive or semi-cursive scripts used in the Christian territories north of the Pyrenees, especially in bilingual deeds (in Latin or French and Hebrew) from England from the end of the twelfth century and until the expulsion of the Jews in 1290, as well as in manuscripts from France (and Germany) from the first half of the thirteenth century. Despite the chronological gap between the Catalonian findings and the English and French ones, it is clear that the script style used in Christian Spain is close the type that was crystalising in northern France (and in its English offshoot, in wake of the Norman conquest) and in the German lands. The classification of Hebrew manuscripts into types demonstrates that specific codicological traits are always coupled with specific script styles (with the exception of manuscripts copied by immigrant scribes). Accordingly one should assume that just as the script used in Christian Spain was different from that used in Muslim Spain – the style of the former disclosing affinities to the Ashkenazic type (see below) in view of the later findings of that type – it was also accompanied by a different bookcraft which resembled that employed in Christian territories north of the Pyrenees. The morphological and stylistic affinities with the Hebrew script shared throughout the domain of Christian territories, like the shared Latin Carolingian script employed there, gradually disappeared from Catalonian deeds after the beginning of the reconquest of the Muslim cities, as early as the end of the eleventh century, and the unique features of the Spanish/Sefardic-Andalusian script are already displayed conspicuously in a deed from 1092, although the Christian-European style was used, sometimes in a hybrid mode, until 1112. It follows that the reconquest of the Muslim regions by Christians did not lead to the diffusion of the European-Christian styles of the Hebrew script, but paradoxically, it appears to have led to the adoption of the Spanish-Muslim writing style of the south by scribes in the Christian north.[89]

The earliest extant dated manuscript (dated 1202) bearing an indication of locality from Provence in southern France[90] - which borders with Catalonia - derives from around the same time when the extant dated parchment codices from Catalonia were produced.

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[89] See in detail, Beit-Arié, 'Hebrew Script in Spain', esp. pp. 227-229; M. Beit-Arié, 'Introduction', in *Specimens of Mediaeval Hebrew Scripts*, 2, (in Hebrew) pp. 12-13. To the literature on the Catalonian documents one should add Klein's corpus, in which 18 documents from the years 1117-1316 were added, three of which date from the twelfth century: E. Klein, *Hebrew Deeds of Catalan Jews / Documents hebraics de la Catalunya medieval*, Barcelona–Girona 2004.

[90] MS Rome, The Jewish Museum in the Central Synagogue, no VI in Gottheil's list, copied in Arles. See R. Gottheil, 'Bible Mss. in the Roman Synagogues', *ZfHB*, 9 (1905), pp. 179–180, no. VI.

The script, character, and codicological features of this manuscript are identical to the script and features of later manuscripts produced in that region and in the adjacent Bas-Languedoc, and are all unmistakably Spanish-Muslim. It can be assumed that in these regions, like in Catalonia, the previously practiced script and booklore were of the European-Christian type. Provence's close political, cultural and linguistic linkswith Catalonia, which might have facilitated Spanish-Muslim booklore to permeate it from adjacent Christian Catalonia after the first reconquest, it seems that this was not the reason for its adoption there. The already established features of the 1202 manuscript attest to the prior adoption of the Andalusian tradition. It is probable that this process began during the second half of the twelfth century following the Almohad invasion of Muslim Spain and the persecution of the Jews there. Through the notable influence of Jewish scholars who fled Muslim Spain to settle in Provence, both bookcraft and script styles began to gradually change, taking on a Spanish character.

To sum up, both bookcraft and script style that had originated most probably in the Muslim Maghreb were further shaped and elaborated in Muslim Spain, and eventually adopted throughout the Iberian Peninsula and even beyond it.

[3] **Ashkenaz, Ashkenazic** – This geo-cultural and typological term requires clarification and definition, keeping in mind its problematic nature. Its definition applies to bookcraft and script style rather than to a geographical or political entity. Therefore it is applicable beyond the boundaries of a certain region or geo-political unit. Just as the term 'Sefarad' may be misleading, since in our typology it comprises North Africa, Sicily, Provence and Languedoc as well, so can the term 'Ashkenaz' and its derivations be even more misleading. This term has been chosen as a general demarcation of the booklore and script style which were present in books from the twelfth century onward in a zone that included a number of regions: the German speaking areas that were part of the Holy Roman Empire, but also adjacent areas, such as Bohemia and Moravia, and eventually also Poland, and France (with the exception of southern France) and its offshoot in England subsequent to the Jews' settling there after the Norman Conquest. Indeed, I am aware of the use of the biblical name 'Ashkenaz' in medieval sources to designate German lands (initially the Rhineland), a designation that only later assumed a more comprehensive cultural significance. However, in the absence of a more suitable Hebrew term, I have chosen to employ this

name and its derivations in the broad cultural sense of the later period[91] in order to designate the common booklore practised in north-western Europe, namely the regions of northern France, England and Germany and its environs.[92] Although after the thirteenth century slight differences emerge in the production practices of the codices and their script styles (in particular in the square script) between the main sub-regions in north-eastern Europe (and eventually also in Central and Eastern Europe) – France and England on the one hand, and the other lands (which we designate as 'Germany') on the other – these differences require further investigation: in itself an extremely challenging undertaking due to the small number of indications of locality. This said, they do not justify a splitting of the clearly shared codicological and palaeographic tradition.

[4] **Italy, Italian** – a codicological type and script type characteristic to the Italian peninsula. From a historical point of view one should wonder whether Italy can be perceived as a uniform entity from the time that Hebrew codex production first began there. The production of Hebrew books before the thirteenth century was no doubt concentrated in southern Italy, especially in the province of Puglia, in which Jewish communities and prestigious religious academies (*yeshivot*) had flourished since the ninth century – the presumed era when the development of Hebrew bookcraft began – and until their destruction in the last decade of the thirteenth century. This important spiritual centre in southern Italy was under extended Byzantine rule, embedded in Greek booklore until 1070, shortly before the earliest extant dated manuscript. Did the codicological profile of Hebrew manuscripts produced in southern Italy in the earlier period diverge from the profile known to us from most of the Italian manuscripts and in fact reflect a Byzantine tradition, and should it be regarded, accordingly, as a Byzantine type? There is no easy answer to this question, just as there was no easy one regarding the source of the Sefardic type. We do not possess any localised manuscripts from the Puglia's Byzantine period, yet we can estimate, with a large degree of

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[91] See A. Grossman, *The Early Sages of Ashkenaz: Their Lives, Leadership, and Works* (900-1096)[3], Jerusalem 2001 (in Hebrew), p. 1, n. 1. Grossman notes that from a cultural point of view, the Jews of Ashkenaz included the Jews of northern France and some of the Slavic lands; our terminology too refers to the cultural entity common to Germany and northern France.

[92] European languages permit the use of other terms such as the hyphenated "Franco-German" (in English), although it seemed to me preferable to adopt a shared typological term and employ the Hebrew one even in other languages.

certainty, that indeed, the two earliest extant manuscripts - the first of which was dated 1072/3 and the second in its close vicinity - were copied in Otranto at the far end of Puglia.[93] These manuscripts do not display substantially different attributes from those of the few dated manuscripts produced up to the latter quarter of the thirteenth century in Italy. It is quite possible that these had been produced in Puglia or Campania in the south, and that only after the destruction of those communities did the centre of book production migrate to central Italy, where religious academies and intellectual activity are known from as early as the tenth century, eventually migrating further north. Careful study of the development of the Italian scripts could perhaps allow future studies to identify the Byzantine aspects of the Italian codicological type. Given the current state of knowledge, it seems that the various permutations of this type encompassed the entire peninsula. From a historical point of view, it seems likely that the Italian booklore emerged and was consolidated in Byzantine Italy independently of the Byzantine booklore that was prevalent in the Greek Isles and in the Balkans,[94] and that it spread from southern Italy to the entire peninsula. This assumption may explain the marked uniformity of book production in Italy.

[5] **Byzantium, Byzantine** – Manuscripts of this type were produced and their attributes crystallised in Greece and the Greek Isles, in the Balkans, in western Asia Minor, and in areas surrounding the Black Sea, territories that had been part of the Byzantine Empire before its decline. It is therefore appropriate to demarcate this type within the boundaries of Byzantium and to use for it the term 'Byzantine' rather than the term 'Romaniote' which delineates the reduced diffusion of the type and as such reflects a later reality. The uniqueness of this codicological type, which displays characteristics that are typical of the Middle East together with some that are typical of Europe, lies in the scripts employed in it, notwithstanding some resemblance of its square script to the Oriental type, and of its semi-cursive script to the Italian type. The square Byzantine script and the typical Byzantine semi-cursive are known to us from

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[93] The scribe who copied that earliest manuscript dated 1072/3 participated partially in the copying of another, undated, manuscript – a Mishna to which the chief copyist added glosses in the unique Otranto dialect inscribed in Hebrew characters. For details, see *Codices hebraicis*, Part II, Manuscrit 38.

[94] At the same time, one cannot ignore the considerable morphological similarity between the semi-cursive Italian script and the semi-cursive Byzantine script, and perhaps also between the formats of Italian and Byzantine manuscripts, which might attest to a known affinity between the bookcraft and codex design in Puglia and in Byzantium.

dated or datable documents or letters which were preserved in the Geniza at least two-hundred years before the appearance of these scripts in dated codices. During the fourteenth and fifteenth centuries the semi-cursive script took on variations, apparently due to the influence of the Sefardic script imported to the region by Sefardic immigrants.

Map of the geo-cultural division of the main types and sub-types of Hebrew bookcraft and script

Tables 5-10: General statistics of the database, geo-cultural, chronological and geo-chronological diffusion of the dated manuscripts until 1540

The statistics presented in this book derive from SfarData, the database of dated manuscripts, and they have been calculated in two ways. Most of the calculations are based on the number of records representing codicological-palaeographical units. Each independent codicological unit in a codex has been documented in the database. One codex may contain several codicological units which are independent of each other. In cases where several copyists had participated in the copying of one codicological unit, each copyist was documented as a separate record. One codicological unit may contain several palaeographical units. Statistics pertaining to codicological characteristics that are likely to be individual are based on the number of records that corresponds to the number of palaeographical units. Statistics of basic characteristics – such as place names, writing material, and the destination of the copy – which are shared by all the copyists of one manuscript are based on the number of records that corresponds to the number of codicological units, i.e. codices.

To simplify the presentation, fractions of percentages have been rounded off – fractions less than 0.5 percent were rounded to 0 and those above 0.5 percent were rounded to 1% – and therefore a deviation of ±1% may appear in the total percentage count.

Sometimes deviations occur in the calculation of the total numbers of codices or records when classified according to characteristics (and correspondingly also in the percentage totals), when in the process of recording or encoding the data not all the traits were registered, or when parallel traits were found (e.g. when the same copyist used two script types in one codicological unit), or when a certain feature was classified in two ways because of an uncertainty.

The data reflect the database before its conversion for the internet in 2010. During the process of conversion some data were changed.

Table 5: The manuscripts and various types of records in the SfarData database

Corpus	Records	Codices
Explicitly dated manuscripts until 1540 fully documented *in situ*	3142	2777
Unstudied dated manuscripts (partially recorded on the basis of microfilms or catalogues)	258	249
Unlocated or lost dated manuscripts (recorded on the basis of catalogues and literature)	179	179
Disqualified dated manuscripts (dates found to be unreliable)	85	85
Studied undated manuscripts, either with colophon or with disclosed names, and other select manuscripts	1176	1068
Unstudied undated manuscripts partially recorded on the basis of microfilms or catalogues	430	417
Unlocated or lost undated manuscripts (as above) recorded on the basis of catalogues and literature	69	69
Undated manuscripts (as above) disqualified for various reasons	42	42
Total of *in situ* documented Hebrew manuscripts	4318	3845
Select dated and localised documents	1181	1181
Dated and localised Arabic manuscripts (paper morphology)	143	143
Total	**6705**	**5029**

Table 6: Geo-cultural diffusion of dated manuscript records

Zone	Codices	Records
Sefarad	598 (21%)	695 (2%)
Ashkenaz	361 (13%)	422 (13%)
Italy	989 (36%)	1096 (35%)
Byzantium	276 (10%)	329 (10%)
Orient	398 (14%)	434 (14%)
Yemen	129 (5%)	133 (4%)
Unidentified	26 (1%)	33 (1%)
Total	**2777**	**3142**

Table 7: Chronological distribution of dated codices according to script type

Period	Sefardic script		Ashkenazic script		Italian Script		Byzantine script		Oriental script		Yemenite script		Unidentified	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
894/5 (?)	0	0	0	0	0	0	0	0	1	100	0	0	0	0
901–1000	1	9	0	0	0	0	0	0	10	91	0	0	0	0
1001–1100	4	8	0	0	8	16	0	0	38	75	0	0	0	0
1101–1200	6	8	4	6	2	3	2	3	55	77	0	0	2	3
1201–1300	60	21	85	30	54	19	7	2	74	26	4	1	0	0
1301–1400	212	31	169	25	116	17	66	10	83	12	34	5	3	0
1401–1500	653	41	274	17	325	20	168	11	88	6	81	5	5	0
1501–1540	176	39	64	14	118	26	28	6	32	7	24	5	0	0

Total	1112	35	596	19	623	20	271	9	381	12	143	5	10	0

% Percentage of the total corpus for the period   # number of records

Table 8: Chronological distribution of dated manuscripts and their records

Period	Codices	Records
894/5 (?)	1	1
901–1000	11	11
1001–1100	40 (1%)	51
1101–1200	68 (2%)	71
1201–1300	243 (9%)	286
1301–1400	600 (22%)	681
1401–1500	1406 (51%)	1593
1501–1540	408 (15%)	448
Total	**2777**	**3142**

Table 9: Geo-chronological distribution of manuscripts and their records

Zone	Period	Codices	Records
Sefarad	1001–1100	2	5
	1101–1200	6	7
	1201–1300	57	58
	1301–1400	151	160
	1401–1500	327	388
	1501–1540	55	77
Ashkenaz	1101–1200	4	4
	1201–1300	68	85
	1301–1400	126	155
	1401–1500	132	145
	1501–1540	31	33

Italy	1001–1100	2	8
	1101–1200	2	2
	1201–1300	47	57
	1301–1400	139	152
	1401–1500	608	676
	1501–1540	191	201
Byzantium	1101–1200	2	2
	1201–1300	4	4
	1301–1400	58	76
	1401–1500	150	183
	1501–1540	62	64
Orient	894/5 –1000	12	12
	1001–1100	36	38
	1101–1200	51	53
	1201–1300	62	77
	1301–1400	89	98
	1401–1500	104	109
	1501–1540	44	47
Yemen	1101–1200	1	1
	1201–1300	4	4
	1301–1400	33	34
	1401–1500	68	70
	1501–1540	23	24
Unidentified	1101–1200	2	2
	1201–1300	1	1
	1301–1400	4	6
	1401–1500	17	22
	1501–1540	2	2

Total		2777	3142		

Table 10: Summary of statistics concerning the dated records before 1540

% Percentage of the total corpus for the period   # number of records

Period	Sefarad		Ashkenaz		Italy		Byzantium		Orient		Yemen		Unidentified		Total in corpus
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	
894/5 (?)	0	0	0	0	0	0	0	0	1	100	0	0	0	0	**1**
901–1000	0	0	0	0	0	0	0	0	11	100	0	0	0	0	**11**
1001–1100	5	10	0	0	8	16	0	0	38	75	0	0	0	0	**51**
1101–1200	7	10	4	6	2	3	2	3	53	75	1	1	2	3	**71**
1201–1300	58	20	85	30	57	20	4	1	77	27	4	1	1	0	**286**
1301–1400	160	23	155	23	152	22	76	11	98	14	34	5	6	0	**681**
1401–1500	388	24	145	9	676	42	183	11	109	7	70	4	22	1	**1593**
1501–1540	77	17	33	7	201	45	64	14	47	10	24	5	2	0	**448**
Total	**695**	**22**	**422**	**13**	**1096**	**35**	**329**	**10**	**434**	**14**	**133**	**4**	**33**	**1**	**3142**

5. The unique character of Hebrew book production[95]

Unlike the basic centralised nature of medieval Latin, Greek, and to some extent, Arabic book production, and unlike the authoritative supervision of the copying of Latin manuscripts and the control over their versions and dissemination in institutional

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[95] This section is a modified, updated and enlarged version of a Hebrew paper, Beit-Arié, 'Public Libraries'. See also idem, 'The Individual Circumstances of The Hebrew Book Production and Consumption', in *Manuscrits hébreux et arabes: Mélanges en I'honneur de Colette Sirat* (Bibliologia, 38), ed. J. Olszowy-Schlanger & N. De Lange, Turhout 2014, pp. 17-28.

collections, be they ecclesiastical, royal, or aristocratic, the Hebrew medieval book was initiated, produced, consumed and kept individually. Testimonies provided by copyists in their colophons and the absence of contrary evidence in indirect historical sources such as the responsa, attest that no Jewish establishment – whether centres of learning, *batei midrash*, *yeshivot*, synagogues, or community authorities – initiated and financed the production of Hebrew manuscripts; nor did they administer the selection and the versions of texts to be copied, or assemble and preserve them in communal or scholarly collections.[96] Until the late middle ages, Latin manuscripts were manufactured and usually kept in ecclesiastical centres and institutions. In the early Middle Ages and at the height of that era, books were produced mainly in monasteries: there, canonical texts were copied in the scriptorium – a collective atelier in which the monks were engaged in copying – in accordance with the monastery library's ecclesiastical needs and functions or as commissioned by other monasteries.[97] Books were frequently kept and used in the very place where they had been produced.[98] Later, books were manufactured in cathedral ateliers as well. Eventually, universities initiated the production of books (first at the University of Paris, in the 1250s and 1260s); there, manuscripts were copied in the *pecia* system, namely - dismantling the model into small quires and distributing those to a number of qualified copyists. This method guaranteed

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[96] On the individual character of medieval Hebrew manuscript production, see Beit-Arié, 'SFARDATA', pp. 167-168; idem, *East and West*, pp. 81-83; idem, 'Transmission of Texts', pp. 38-39; idem, *History of Production* pp. 22-23 (234-235). In my book *Unveiled Faces* (pp.84-87), I discuss the paradox involved in Hebrew book production, which had an unmistakable individual character, while being characterised by stereotypical book-craft and writing styles in each geo-cultural region.

[97] On the large-scale production of bibles in the scriptorium of the important monastery of Tours in France during the Carolingian era and on the copying of other books there for monastic libraries in Tours and outside Tours, see D. Ganz, 'Mass Production of Early Medieval Manuscripts: The Carolingian Bibles from Tours', in *The Early Medieval Bible: Its Production, Decoration, and Use*, ed. R. Gameson, Cambridge 1994, pp. 53-62. On the basis of the extant copies Ganz estimated that over the course of the second half of the 9th century this monastery may have produced two complete Bibles every year (ibid., p. 53).

[98] For the history of medieval libraries in Europe, particularly in Italy, see the illuminating discussions by Armando Petrucci, 'Il libro manoscritto', in *Letteratura Italiana*, ed. A. Asor Rosa, vol. 2: Produzione e consumo, Turin 1983, pp. 499-524; idem, 'Le biblioteche antiche' in ibid., pp. 528-554, and in English translation, as a chapter of his book, idem, *Writers and Readers in Medieval Italy: Studies in the History of Written Culture*, ed. and transl. C.M. Radding, New Haven-London 1995, pp. 169-235. On the identity or connection between the scriptorium and the monastery library, see ibid., pp. 203-204. Even Petrucci, who challenged the traditional view concerning the total centralisation of Latin book production in the early medieval monastic and ecclesiastical scriptoria, only demanded that this view be 'somewhat' altered (ibid., pp. 77-102, esp. p. 101).

quick supply and uniform versions of the studied texts.[99] Only in the late Middle Ages, from the beginning of the thirteenth century onward, were the production and consumption of manuscripts taken over from the monastic and ecclesiastical settings, gradually shifting into private hands.[100] Even at that stage book production was being carried out to a large extent in manufacturing centres and commercial ateliers, although initiated by private hands.[101] In those times Latin books were preserved in institutional collections, as was customary in Islamic countries too. Though many church dignitaries or aristocracy set up private libraries, these can be considered institutional rather than private collections. Indeed, in mid- to late fifteenth-century Italy, libraries that were established by princely initiative under humanistic influence are nowadays regarded as the precursors of public or state libraries.[102]

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[99] For the latest collected studies, see La production du livre universitaire au moyen âge: Exemplar et pecia – Actes du symposium tenu au Collegio San Bonaventura de Grottaferrata en mai 1983, ed. L.J. Bataillon, B.G. Guyot & R.H. Rouse, Paris 1988; G. Murano, Opere diffuse per exemplar e pecia, Turnhout 2005. See also the summary by Maniaci, Archeologia, pp. 139-143.

[100] See Ornato, *Apologia*, p. 13. On the debate between scholars as to whether secular urban scriptoria had flourished at the time when monopoly over book production was taken out of monastic hands, see Elizabeth Eisenstein's monumental book: *The Printing Press: Communications and Cultural Transformations in Early-Modern Europe*, vol. 1, Cambridge 1979, pp. 12-15. Carla Bozzolo, who examined more than 800 manuscripts produced in the Rhine valley dating from 1380 until 1500 according to the volumes holding the dated Latin manuscript corpora, found that even at such a late period, 61% of the manuscripts were destined for the ecclesiastical establishment (in the 15th century the rate of book ownership of this body was 69%) and the rest were produced for individual use: out of which 74% for the clergy, 14% for students (connected to the Church) and only 10% for secular users. The rate of copyists who can be identified as secular did not exceed 2% (in France and Italy the figure was higher, since jurists, notaries, and clerks often substituted clerical copyists in those countries. See C. Bozzolo, 'La production manuscrite dans les pays rhénans au XVe siècle', *Scrittura e civiltà*, 18 (1994), pp. 203-211.

[101] See the comprehensive study of the commercial secular production that had begun in Paris as early as the 13th century: R.H. Rouse & M.A. Rouse, *Manuscripts and their Makers: Commercial Book Producers in Medieval Paris*, 1200–1500, vols. 1–2, Turnhout 2000. Despite this commercial development in the production of Latin books, the authors note that from the end of the 13th century onwards the University of Paris controlled the book trade in that city (ibid., vol. 1, pp. 75-81). This study also reveals that in these commercial production ateliers one already discerns processes of version-standardisation and monopolisation of distribution as well as a large measure of uniformity in the design of copies of a known text; in other words, even in the course of the privatisation of the Latin book the tendency toward centralisation was preserved. See also, recently, in the collection *Patrons, Authors and Workshops: Books and Book Production in Paris around 1400*, ed. G. Croenen & P. Ainsworth, Louvain–Paris–Dudley, Mass. 2006. See also Derolez's concise summary of the transformations that the production of Latin books underwent in the later Middle Ages, during the twelfth to fifteenth centuries, with the emergence of urban and secular culture: A. Derolez, *The Palaeography of Gothic Manuscript Books: From the Twelfth to the Early Sixteenth Century, Cambridge* 2003, pp. 28–31.

[102] See Petrucci, *Writers and Readers* (above, n. 98), pp. 225-231. An exhaustive summary of the research on the development of private libraries and their accelerated growth among the cultural, social, and political elites (princes and rulers, scholars and humanists, wealthy merchants and those on their way up)

By way of contrast, the making of Hebrew books was almost exclusively the product of private initiative aimed at personal use. This can be deduced not only from the rather meagre indirect information on production practices, on the copying, purchase, consumption and keeping of books as well as on their social function and economic value found in literary and documentary sources, but mainly from the abundant and decisive evidence contained in the manuscripts themselves.

Scholars, literati, or anybody who could read (in certain areas, like Italy from the late thirteenth century onward, this could also be a learned or literate woman) and who wished to obtain a copy of a text – biblical, exegetical, liturgical, talmudic, Midrashic, halakhic, philosophical, kabbalistic, literary, or scientific – had three options. They could try to acquire an existing copy from an owner in their vicinity: Indeed, the scarcity of evidence (if any) for the presence of book-sellers – at least in Europe and North Africa – and the records of ownership transfers inscribed in many manuscripts, suggest that books were usually bought second-hand directly from their owners and not from dealers;[103] this said, we find in Italian deeds of sale that would be inscribed at the end of manuscripts, some rare mentions of an intermediary or agent who would represent the buyer and pay for the book. No doubt such acquisitions were limited by the availability of the book in the buyer's region, and the chances of finding a specific wanted text – unless it were a common one – were meagre. One may infer that due to scant supply, books would be acquired at random just because they were obtainable. The same fortuitousness goes for manuscripts inherited by the heirs of a deceased owner. For indeed, according to many inscriptions which survived in Italian manuscripts, the library of the deceased father would usually be divided among his sons.[104]

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during the Italian Renaissance, particularly in Florence, is provided by Pasternak, Together and Apart, pp. 101-118.

[103] On the rare mention of a Jewish book trader from Perugia (in Umbria, Italy) in two Latin documents from 1345 and 1346, see A. Toaff, *The Jews in Umbria*, vol. 1: 1245–1435 (A Documentary History of the Jews in Italy, ed. S. Simonsohn; Studia Post-Biblica 43), Leiden–New York–Köln 1993, nos. 171, 180 (Nurit Pasternak drew my attention to these and other documents from this collection mentioned below). However, according to these documents, the said trader dealt only in Latin books.

[104] Certainly some bequests specified particular stipulations for dividing the library of the deceased. According to a will inscribed in Latin in Narni, Umbria in 1475, a Jewish physician stipulated that his library, which included many Latin books he himself had purchased or had inherited from his physician father, should be catalogued by his three heirs and not be sold during five years from the day of his passing. If his grandson were to study and earn a degree in philosophy and medicine, he would have the first right to the books and would be able to purchase them at half their value from the other heirs. See

The two other options facing, already from the time of the earliest dated codices, those who wished to get hold of a book, did not involve hand-to-hand transactions but tailor-made manufacture. One possibility was hiring a professional or occasional scribe; the other option, more suited to those who could not afford to purchase an available book or hire a scribe,[105] was producing one's own book; namely, copying the desired text in one's own hand.[106] Both ways of producing new books depended of course on the availability of a manuscript that could serve as a model for the copying. The ways by which such models were obtained (in some regions copyists would designate such a model by the term העתק)[107] are still unknown to us. How were such model copies located, how was the owner's permission to reproduce his manuscript obtained, and on what conditions was consent secured? Were the books given out on loan, or did the hired scribe or the copyist for his own use produce them at the owner's homes? These

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A. Toaff, *The Jews in Umbria*, vol. 2: 1435–1484 (A Documentary History of the Jews in Italy, ed. S. Simonsohn; Studia Post-Biblica 44), Leiden–New York–Köln 1994, no. 1685.

[105] Later, possibly in the 17th century, Yosef ben Moshe testified in a colophon he wrote in Crimea to his own financial inability to purchase books, which led him to undertake the task himself: העיר ה׳ את רוחי לשלוח ידי במלאכת הקדש. כי את דעתי קצרה לעיין בו. אבל מרוב תשוקתי כתבתי כי אין בי כח לקנות ספרים מפני עניותי (MS St. Petersburg Евр. I 593. The date in gematria seems to be equivalent to 1327, but it clearly did not include the calculation of the centuries according to the Hebrew calendar).

[106] On the prevalence of self-produced copies, as evidenced by extant colophons, see below in the current subchapter. According to Ashkenazic literary sources several of the greatest scholars copied for their own use and, apparently, were commissioned to copy for others as well. See Shoulvas, 'Attitude to Books', p. 341.

The copyist's self definition as a 'demi-scribe' (חצי סופר) and an instructive example regarding the two possibilities of self-production are contained in MS New York, JTSA, 6470. This manuscript includes a *Sefer Mitsvot Qatan* copied by a professional scribe, but its final folios (fols. 128-153) were completed in a less skilled hand in 1421 in Germany by the person who had commissioned the copy. In his colophon he noted נשלם ספר המצוות לאויי׳ ועשה. אשר נשמע ונעשה. ועל ידי שנים נעשה. וכל אחד כאילו עשה. והאחרון עיקר שסילק מעשה הראשון וסיימתי לעצמי ט״ו לחדש אייר שנת קפ״א לפרט לאלף הששי. אני חצי סופר נתן ב״ר שמחה קולנער שלי״ט.

El'azar ben Asher HaLevy, the compiler and editor of the historical anthology *Sefer ha-zikhronot* (Germany, between 1324 and 1341), which is preserved in MS Oxford MS. Heb. d.11 in his own hand, writes in his foreword a will addressed to his sons, that they should not divide his book amongst them nor sell it, but should draw lots to see which of them should inherit it, and should instruct their offsprings to do the same, and he thus explains: והנני מצוה לבני שהשם יזכנו לירש את הספר הזה ספר הזכרון שלקטתי מכמה ספרים וכתבתי אותן והנחתי כמה עסקים בגללו כדי לגמרו. ועיקר כתיבתו היתה בימי החורף ובימי הגשמים, כי לא היה הפנאי כי אם באותן הימים <...> יען וביען, אם היה לי לכותבו עבור שכר, לא הייתי לוקח משנה שכר שכיר? <...> כי לא ימצא סופר בכל העולם שיעתיקו בפחות משישה זהובים קטנים מלבד יציאת הקלף (Yeraḥmi'el ben Shelomo, *Book of Memory, that is the Chronicles of Jerahme'el*, ed. E. Yasif, Tel-Aviv 2001, p. 70 [in Hebrew]).

[107] See Beit-Arié, 'Worms', p. xvi, n. 53.

are questions that cannot be answered with any degree of certainty due to an almost total lack of testimonies.[108]

The literary sources at our disposal relating to book production and consumption comprise mainly the European halakhic literature, the *Tosafot*, responsa and various early halakhic works, as well as the *Sefer Ḥasidim,* the major work of the Ashkenazic Pietist movement in Germany, which is our richest Hebrew source of knowledge on

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[108] Only scant information is found in colophons. Sometimes copyists would name the person who owned the book which served them as a source, but that would occur only if he was a renowned Rabbinic authority, the association with whom would serve to promote the version that was being copied (see below, chapter 2, section 6). In 15th-century manuscripts from a number regions some copyists would note that they had used several copies as a source; see below, chapter 12, and see also, ibid., on copyists' complaints – some no doubt apologetic, or as prescribed by conventional colophon formulas – concerning the corrupted texts from which they copied.

The Tosafists had already attested to the practice of loaning books from their owners for a price, for the purpose of copying; see Shoulvas, 'Attitudes to Books', p. 341. The Latin contract signed in Marseilles in 1316 between a book-owner and an individual who was borrowing the book in order to copy it stating a steep price along with restrictions in regard to the copying (see below, n. 121), should not be regarded as the norm, since this contract pertained specifically to a medical book that served as a source of handsome income for the owner. However, a number of Byzantine colophons from copies containing other genres indicate that even owners of non-professional manuscripts would sometimes refuse to make them publicly available for copying, or agree to do so only for a fee, and it may well be that in the Byzantine zone a monopolistic attitude prevailed among book-owners. In the margins of a colophon of Klalei Hamitsvot by Yosef Gikatilla, copied by the scribe in 1471 for his son (copied by another hand until *fol.* 64), he noted that he had been obliged to complete the rest of the copy in 7 days only because the owner of the book which served as his model had refused to allow him to use it; but, since the owner had inadvertently left the book behind with the scribe, the latter took advantage of the opportunity to make a rush copy before the owner returned and angrily claimed the book, suspecting that it had been copied (see the footnote and description of the manuscript in *Manuscrits médiévaux* III, 4). In the colophon of MS Oxford MS. Heb. d. 1 (Neubauer & Cowley Catalogue 2648/1), containing a supercommentary to Rashi, also copied in Byzantium, in 1422, the scribe noted that the person who commissioned the copying had taken an oath precluding him from allowing other copies to made: ונכתב לנתן המערבי ונשבע לפני שני עדים שלא יתנהו לשום אדם להעתיקו מעתה עד תום עשרה <!> שנים ופרע משלם. The party who had commissioned the copying committed himself before the hired scribe to that for another ten years he would not give it out to be copied again; the latter apparently held the original source of the copy in his possession and sought to maintain his monopoly over this intellectual asset, which provided him with some income. Again, from Byzantium, in the colophon of MS Oxford MS. Mich. 138 (Neubauer and Neubauer & Beit-Arié Catalogues 1982), inscribed circa 1450 mostly in Ashkenazic script, we read of the owner's demand to have the source returned to him upon completion of the copying: ובכאן שלם <...> בתי הנפש והלחשים <שירה, מאת לוי בן אברהם> וכתבתיו למהר״יר מזל טוב בעל <!> מנת שיחזירהו לי כאשר אשאל אותו ממנו אחר שהעתיקו. It would appear that the scribe had copied this manuscript for an individual who wished to make more copies of it, on condition that the manuscript be that scribe to him as soon as he asks for it. In any event, we are in possession of a few pieces of evidence indicating that copies of uncommon texts were not given freely for recopying, except under particular stipulations and perhaps financial considerations.

books in general, and on scribal craft and practices in particular.[109] The European documentary sources comprise mainly indications of ownership, deeds of sales of manuscripts, inscriptions relating to the inheritance of books and appraisals of their value (only in Italy), as well as lists of books owned by one of the manuscript owners, inscribed on one of the manuscript's blank pages.[110] The main documentary sources in the Orient are book-lists that were inscribed separately and preserved in the Fusṭāṭ Geniza. They shed light on the production, consumption, and marketing of manuscripts, especially in eleventh- through thirteenth-century Egypt. The documents comprise catalogues and inventories of private libraries; lists prepared by book dealers, which sometime include prices; inventories of deceased persons' estates or of synagogue property; lists by professional scribes enumerating, among others, manuscripts deposited in their keeping in order to be copied, as well as calculations of fees; lists of borrowed books, lists of pawned books kept by money lenders, some of them with indications as to their current value.[111] Among the Geniza documents, letters relating to

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[109] See S. Assaf, '"Am Hasefer" ve-hasefer' *Reshumot*, 1 (1917) (= Assaf, *Be'Oholei Ya'aqov*, pp. 1-26]; Assaf, *Mekorot*, Part II, sections 16, 38, 48, 49; Part IV, section 12, and also according to the index entry ספרים; Shoulvas, 'Attitude to Books'.

[110] Rothschild published a list of all 48 book-lists that have been printed: J.-P. Rothschild, 'Les listes des livres reflet de la culture des Juifs en Italie du nord au XVᵉ et XVIᵉ siècle', *Manoscritti, frammenti e libri ebraici nell'Italia del secoli XV–XVI – Atti del VII Congresso internazionale del'AISG, S. Miniato, 7–8–9 novembre 1988*, ed. G. Tamani & A. Vivian, Rome 1991, pp. 163–193. In his book on the Italian Rabbinate during the Renaissance, Robert Bonfil documented 41 Italian book-lists, some of which had been previously printed, and others that had not (R. Bonfil, *Rabbis and Jewish Communities in Renaissance Italy*, Jerusalem 1970, appendix B, pp. 295-298 (in Hebrew) [The appendices were not included in the English translation of the book: R. Bonfil, *Rabbis and Jewish Communities in Renaissance Italy*, transl. J. Chipman, London–Washington 1993]. The list inscribed at the front of MS London Add. 27169 is perhaps the earliest one known to us. It includes some forty codices, and should apparently be dated to the twelfth century (see the list below, in the appendix to chapter 4, n. 52).

[111] A great deal of detailed and valuable information is contained in 114 book-lists and documents assembled in Allony, *Jewish Library*. For the characterisation of the book-lists, see the preface (p. xiv) by the editor, Miriam Frankel, who added copious notes to the corpus prepared by Allony, who did not live to see it published. Especially noteworthy are the many book-lists compiled by the learned scholar, author, bibliographer, and copyist Yosef ben Ya'aqov HaBavli Rosh HaSeder in Fusṭāṭ during the first decade of the 13th century (ibid., nos. 97-114). His book-lists, replete with bibliographical information and unequalled by any other lists in either East or West, are lists of sales, and include prices of copying, plans of copying, and unparalleled codicological details – describing not only the writing material (in non-paper manuscripts), or the type of paper (Iraqi or Baghdadi), but sometimes also the format of the manuscripts (indicated usually by the manner of folding the paper sheet into a 'quarter' or 'eighth' of a paper), as well as the frequent noting of the number of ruled lines. His lists, like other Oriental book-lists, also note the number of quires in the books. And see ibid., the informative section on classification and cataloguing methods (nos. 30-39), containing also a (unique?) listing of books (no. 39), according to their incipits.

the commissioning and copying of manuscripts were also found, including details about the scribes' fees.[112] Book-listings in Italy and especially in the Middle East sometimes provide codicological or even palaeographical information, as for instance the writing material, the book format, the kind of binding and more, and most illuminating – the type and style of script, especially in Italy, the land of many immigrants in which a large variety of scripts coexisted, proving that the owners of private libraries could well distinguish between the writing styles .[113]

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[112] S. D. Goitein combed through many records and made use of them. See Goitein, *Mediterranean Society*, especially the subchapter entitled 'Scribes and Copyists' in vol. 2, pp. 228-240, and also according to the index entries 'Books', 'Scribes', 'Copyists', and similar terms in the volume of indices. See also, 'Books: Migrant and Stationary – A Geniza Study', in *Occident and Orient: A Tribute to the Memory of Alexander Scheiber*, ed. R. Dán, Budapest–Leiden 1988, pp. 179–198. The Palestinian sources were collected in the subchapter entitled 'Book production' in Gil's History of Palestine, pp. 232-235, which also contains references to the documents themselves that were critically edited in volumes 2 and 3 of the original Hebrew book. See ibid*.,* for the extensive activity of the scribe Yisra'el ben Natan Sahalon the Maghrebi, who was located in Jerusalem and copied books during the 1050's and 1060's.

An early and fascinating testimony concerning the commissioning of a copy of the *Book of Josippon* by a dignitary in Puglia in Southern Italy shortly after 925 comes from an epistle, cropped at its beginning, which copy was preserved in a late Oriental manuscript and survived on a folio from the Geniza (MS New York ENA 4009.5). The letter was published by E.N. Adler, 'Un document sur l'histoire des juifs en Italie', *REJ*, 68 (1914), pp. 40–43; see ibid*.,* pp. 288-290 for S. Poznański's commentary on the letter; for the photographic plate of the recto of this letter see E.N. Adler, *Catalogue of Hebrew Manuscripts in the Collection of Elkan Nathan Adler*, Cambridge 1921, pl. 4. The epistle relates details concerning the pogroms against the communities of Oria and Otranto during the Arab invasion in 925, and about a number of scholars who survived and escaped both towns. At its end its author makes known that Shemu'el, who had escaped the attacks a short while earlier, apologises that the copy of *Josippon* he had prepared on behalf of the epistle's addressee had been robbed while he was on the road, near the location at which the epistle was written, adding that upon his arrival at that place the community leader and his men went out on horseback to attempt and retrieve the robbed item (apparently without success). The details in the epistle allowed Cassuto to identify its historical background, and he concluded that it was written in Bari, reinforcing Adler and Poznański's conjecture that the addressee was Ḥisdai Ibn Shaprut of Cordoba, a conjecture based chiefly on the fact that following this epistle another was copied, written by 'Yehuda ben Ya'aqov of Rome, of blessed memory, to R. Ḥisdai, of blessed memory.' See U. Cassuto, 'Una lettera ebraica del secolo X', *Giornale della Società asiatica italiana*, 29 (1918/1920), pp. 97–110. However, this identification is perhaps hardly compatible with Ḥisdai's age, which at time of the events described in the epistle would have been around fifteen. This fragment seems to have been part of a late codex of Italian epistles, which were copied and assembled much later, and not necessarily epistles addressed to Ḥisdai.

A great deal of information about books, their commissioning and purchase, is contained in dozens of letters sent as responses to Nahary ben Nissim, a merchant and scholar who lived in Fusṭāṭ for some fifty years until his death in the late eleventh century, as well as in several letters he himself wrote. Most of these sources have been published (some re-published), in Gil, *Jews in Islamic Countries*, vols. ii-iv.

[113] For the codicological data, see above, at the beginning of n. 112. On indications of script styles, such as Iraqi, French, Provençal, Catalan, and Western (Maghrebi), see below, chapter 11, and also Beit-Arié, *East and West*, p. 33.

Latin inventories of large Jewish private libraries in Europe, recorded and deposited in Christian archives – no doubt for legal ends – survived in Italy and particularly in Spain. Among them the inventory recording the largest number of manuscripts, and apparently the largest Jewish library in the Middle Ages, that of the library of Mordecai Finzi (a well-known scientist who copied many manuscripts for his own use) and his brother Yitsḥaq,[114] sons of the money-lender (or banker) Avraham Finzi . The large book collection (most likely accumulated by the father) was kept in Bologna, and according to the Latin inventory attached to a legal document from 1454 kept in the city archives, the Finzi library comprised 226 books.[115] Another Latin inventory recording a multi-volume private library and dated 1375 was that of Yehuda Leon Mosconi's collection in Majorca; two years later, following his death, an inventory was compiled in view of an auction, listing 156 books.[116] A detailed inventory of 103 books was inscribed,

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[114] See Y.T. Langermann, 'The Scientific Writing of Mordecai Finzi', *Italia*, 7 (1988), pp. 7–44. On the manuscripts he copied, see M. Beit-Arié in *Bibliotheca Rosenthaliana: Treasures of Jewish Booklore*, ed. A.K. Offenberg, E.G.L. Schrijver & F.J. Hoogewoud, Amsterdam 1994, p. 8.

[115] See C. Bernheimer, 'Una collezione privata di duecento manoscritti ebraici nel XV secolo'*, La Bibliofilia*, 26 (1924–1925), pp. 1–26; on the total number of books, see ibid.*,* p. 24. One of the most interesting manuscript collections was that of the merchant Menaḥem ben 'Aharon of Volterra in mid-15th century Tuscany, which may have been even larger than the Finzi collection, having been accumulated within the family over generations. These Hebrew manuscripts, or at least part of them, were plundered in 1472, when the town of Volterra was devastated by Federico de Montefeltro Duke of Urbino, who seized these books for his private collection. From Menaḥem da Volterra's collection at least 40 Hebrew manuscripts survived, most of them bearing indications of ownership by Menaḥem and his family members, sometimes with details about former owners. Most of them are now part of the Urbinati collection in the Vatican Library (see the description of the manuscripts of the Urb. ebr. Collection in the Richler & Beit-Arié Catalogue, and especially the historical introduction to the Hebrew collection in the library by D.V. Proverbio (ibid.*,* pp. x-xi-xvii), and see also Pasternak, Together and Apart, pp. 109, n. 69, p. 122 (on methods of purchasing manuscripts, previous owners, and places of provenance), p. 125, n. 167. From the numbering (in Hebrew letters) of the manuscripts which survived in the codices from Menaḥem da Volterra's collection kept in the Vatican library one concludes that the number of manuscripts he amassed was no less than 221 (רכא). See N. Allony, 'Reshimot sefarim ktuvey-yad min hame'a haḥamesh-'esre mi-Tivoli she-be-Italia', *Areshet*, 1 (1959), p. 46 (in Hebrew). The extant part of this collection is compelling and deserving of research. Most of it contains manuscripts in the Sefardic script, copied by immigrant scribes from Spain and Provence who were active in the beginning of the fifteenth century in northern Italy, and only a quarter of them are inscribed in the Italian or Ashkenazic script. Since almost each of the manuscripts includes a notation of its estimated value, these estimates can be compared in view of the content of the books, the different script types, the writing material (parchment or paper), their dimensions and sizes and even their dates of production; such a comparison would allow us to draw conclusions as to the factors that determined their prices.

[116] The book-lists were published in J.N. Hillgarth, *Readers and Books in Majorca, 1229–1550*, vol. 2, Paris 1991, pp. 434–442, and see ibid.*,* for previous publications of the second list. See also in his publication mentioned here below, n. 120 (pp, 297-315), regarding an inventory dated 1330 of Refa'el Dayan's library in Mallorca.

apparently between 1420 and 1430, at the end of a manuscript copied in Oppenheim, Germany in 1415.[117] A library comprising 99 books was bequeathed by Yo'av ben 'Elya of Corregio in Tuscany to his seven sons, who split up his library in 1486,[118] according to an inventory detailing the distribution of the books among the heirs, including an appraisal of the value of most items. In the town of Jaca in the Huesca province of northern Aragon inventories of twenty six private libraries, the largest of which comprised 74 books, were compiled in 1415.[119] Moreover, two exceptional contracts inscribed in Latin were preserved in non-Jewish archives: One was a most detailed contract drawn in 1335 in Majorca between a scribe and a patron commissioning a deluxe production of three decorated manuscripts;[120] The other contract, drawn in Marseille in 1316, relates to the loan of a medical book for one year, and the lending of copying rights for a considerable sum.[121]

In the Middle East too, at least in Egypt, there were large private collections, as evidenced by book-lists preserved in the Geniza. Three twelfth-century inventories, which complement each other and whose beginnings and endings are missing, contain 153 books.[122]

Almost all the literary and documentary testimonies relate to books in private possession, produced as private initiative, and to scribes hired by individuals to produce copies of specific texts for their personal use. All the European book-lists, as well as some of the Oriental ones, were in fact catalogues of private collections or listings of

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[117] See I. Sonne, 'Book Lists through Three Centuries', *Studies in Bibliography and Booklore*, 1 (1953), pp. 55–76. This inventory is a rare example of a book-list in Ashkenaz and, moreover, it is unique among known private European books lists to be classified by topic and subtopic, according to the following order: ׳גמרו׳<ת>׳, ׳תלמוד<ת׳ מתלמוד׳: ספרי׳ <תנ״ך ופירושיו>, <ליטורגיה>, <מדרש, קבלה ופילוסופיה>, ׳פוסקים,
׳תו׳<ספות>׳ ,שלמים׳ ,תו׳<ספות>׳ <!> שאינו ׳פי׳ ,מתלמוד׳ <שלמי׳ים> <רושים׳> ׳פי׳. Not only was the listing of the books classified by topic, but under each topic or sub-topic it had been arranged according to an internal order from the comprehensive to the partial, as is customary in modern bibliography (see ibid., pp. 57-58). Furthermore, the Ashkenazic owner distinguished between three book sizes – large, medium, and small. For a unique terming of a handsome book in this list, see below, chapter 11, n. 11.

[118] Rothschild, 'Listes des livres en Italie', no. V, pp. 302-306.

[119] E. Gutwirth & M.A. Motis Dolader, 'Twenty-Six Jewish Libraries from Fifteenth-Century Spain', *The Library: The Transactions of the Bibliographical Society*, 6th ser., 18 (1996), pp. 27–53.

[120] J.N. Hillgarth & B. Narkiss, 'A List of Hebrew Books (1330) and a Contract to Illuminate Manuscripts (1335) from Majorca', *REJ*, 120 (1961), pp. 316–320.

[121] J. Shatzmiller, 'Livres médicaux et éducation médicale: À propos d'un contrat de Marseille en 1316', *Medieval Studies*, 42 (1980), pp. 463–470.

[122] Allony, *Jewish Library*, no. 4; ibid., no. 70 (the first six lines of the list are missing) contains a record of an estate inscribed by the deceased's son not earlier than the 12th century, which included 112 books; no. 8 is a 13th-century list that enumerates 107 books.

inherited books. Many lists found in the Cairo Geniza were undoubtedly book dealers' sale catalogues, some of them indicating prices and attesting to a developed commerce.[123] European literary sources confirm that even books that were kept in synagogues and *yeshivas* had been copied or donated through private initiative rather than through communal or institutional ones. The rather abundant European halakhic sources encouraging owners of books to lend them out[124] and the stimulus that a number of communities in Ashkenaz provided for the purchase of books by granting tax exemptions at the rate of their value,[125] not only attest to the great scarcity of books,[126]

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[123] Among 114 book-lists collected by Allony in his book *Jewish Library*, there are, according to the editor's classification, 29 inventories of private libraries, 10 lists concerning methods of classifying and cataloguing, 16 lists concerned with commercial matters (prices of books, deals through agents, etc.), 10 estates, 4 lists concerning book loans, 4 lists of books to be copied (one of these, no. 78, from the end of the 11th century is a list of numerous books being sent to Cordoba by a book dealer in the Orient who employed copyists – the last book in this list is כתב אלאסתגני (The Book of Wealth) by Shemu'el HaNagid, a voluminous work in Judaeo-Arabic of which only a small fragment has survived and which copying was shared between 5 copyists whose names were mentioned, a kind of scriptorium!), 3 book-lists of the Babylonian synagogue in Fusṭāṭ, and a list of Karaite books, 18 book-lists by the versatile copyist and book dealer Yosef Rosh HaSeder, and more.

[124] Rabbi Asher ben Yeḥi'el (HaRosh), as mentioned, even approved of a dayyan (rabbinic judge) who fined for ten gold coins a day an individual who had refused to lend a book he owned, see above, no. 61. Assaf, *Be'Oholei Ya'aqov*, pp. 3-6. The lending of books was subject to private initiative in France and Germany. In a dispute about the pawning of books presented to Rabbenu Gershom (Gershom ben Yehuda Me'or HaGola), the pawner claimed that: 'they were new books, and you studied with them and lent them to others and exposed them to smoke'. To this the pawnbroker who had given the loan responded: "I granted the loan on them, provided that they be used for studying and teaching and be lent to others' (Responsa of Rabbenu Gershom, par. 66, cited in H.H Ben Sasson, *History of the Jewish People*, vol. 2, Tel Aviv, 1969, p. 80 (in Hebrew). For the copying of books by a copyist for the purpose of lending them out, in Germany, circa 1200, see the mention in *Sefer Ḥasidim*: הכותב ספרים להשאיל לאחרים יכתוב כל מסכתא ומסכתא בפני עצמה כמו שעושים בבבל, שאם יקשור <היינו יכרוך> יחד סדר, איך ישאיל לאחר כשיצטרך, ומה שבמלכות הזה קושרין יחד סדר כי צריכים לעיין בבית המדרש מסכתא אחרת ואיך יביא כל מסכתא עמו, אבל להשאיל מוטב יקשור מסכת לבד (*Sefer Ḥasidim*, passage 672, and cf. ibid., passage 872. Another testimony in *Sefer Ḥasidim* regarding the copying of books (or the financing of the copy) to be lent out as a substitute for Tora study appears in the passage describing the inverted social-intellectual hierarchy: כי אדם שעוסק בתלמוד ושוכח, טוב שילמד הלכות גדולות וביחוד שידע המצוות, ואם גם זה אינו יכול לדעת, ילמוד אגדות או מקרא, ואם גם זה לא ידע – אם יודע לכתוב, יכתוב ספרים וישאיל או ישכיר סופרים וישאיל ספרים וילמדו בהם (ibid., passage 645); See I. Ta-Shma, 'Mitsvat talmud-tora ke-be'aya ḥevratit-datit be-Sefer Ḥasidim', *Sefer hashana shel universitat Bar Ilan, mada'ei hayahadut u-mada'ei haruaḥ*, 14-15 (1977), p. 10.

[125] Shoulvas, 'Attitude to Books', p. 348 (in Hebrew).

[126] Besides evidence regarding the scarcity of books, there is evidence to the scarcity of scribes as well. The shortage in scribes in Ashkenaz may be deduced from the responsum of Rabbi Meir ben Baruch of Rothenburg regarding a case in which a scribe, while being employed by a certain client, vows to his next customer that upon completion of his current obligation he would render his services to him alone: מעשה בסופר של ראובן שנתן תקיעת כף לשמעון, שכשיגמור מלאכת ראובן לא יכתוב לשום אדם כי אם לשמעון (Assaf, "'Am hasefer'" [above, n. 109], p. 304). And in the Islamic territories, according to a letter sent by Labrat ben Moshe ben Sughmar, the dayyan of the town of Al-Mahdiyya, to Nahary ben Nissim of Fusṭāṭ, who had asked him to arrange for the copying of the books composed by R. Nissim ben Ya'aqov Ibn Shahin, the leader of the Maghrebi Jewry who migrated to Susa after the destruction of Kairouan in

but also reveal the private character of book ownership. Books in communal possession were mostly codices of the Bible, originating in dedications of bequeathed estates. The Karaite custom of donating biblical manuscripts to their synagogues foundations is well attested by many dedication deeds in biblical codices of the Firkovich collection at the National Library of Russia in St Petersburg. In addition, there have been recent discoveries of numerous dedication deeds of exegetical and even philosophical works in Judaeo-Arabic, which were deposited by literati to be made available to the Karaite community.[127] However, the practice of amassing biblical manuscripts in Middle Eastern synagogues was not confined to Karaites, as evidenced by a letter from the Geniza and from the inventories of books from rabbinic synagogues in Fusṭāṭ. According to this letter, two hundred and thirty Bibles, one hundred small codices (apparently of Prophets), and eight Tora scrolls, all looted from the foundations of the Jewish community in Jerusalem by the crusaders when they conquered the city in 1099, were redeemed in Ascalon in the summer of 1100.[128] This said, cumulating biblical (or

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1057. Labrat writes, in Judaeo-Arabic, to inform his correspondent that he appointed someone to purchase parchment in Susa and have it delivered to a scribe, but no scribe was to be found except for one schoolteacher who would copy only occasionally (M. Ben-Sasson, *The Jews of Sicily, 825-1068 - Documents and Sources*. Jerusalem 1991, no. 7, lines 10-13, p. 32 [in Hebrew]).

[127] These dedications are coming to light thanks to the project of cataloguing the Judaeo-Arabic manuscripts of the Firkovich collection in the National Library of Russia in St. Petersburg, under the auspices of the Ben-Zvi Institute in Jerusalem. On dedications of Biblical commentaries, see H. Ben-Shammai, 'Notes on the Peregrinations of the Aleppo Codex', *in Erets u-melo'a: The Jews of Aleppo: Their History and Culture*, vol. 1, ed. Y. Harel, Y. Assis, M. Frankel, Jerusalem 2009, pp. 148-153 (in Hebrew). According to Haggai Ben-Shammai a number of Karaite dedications have been found in non-Karaite, non-biblical books as well (personal communication).

[128] See S. D. Goitein, 'New Sources on the Fate of the Jews during the Crusaders' Conquest of Jerusalem', *Zion* 17 (1952), pp. 132, 137, 141-142 (Goitein eventually published the second part of the document. For information about it see Haggai ben Shammai's article, above, n. 127, p. 146) and cf. ibid., pp. 132-133 on the comparisons Goitein drew between this letter and the inventories of Biblical books (and Tora scrolls) in the main synagogues of communities in Fusṭāṭ and Cairo. The inventories of objects in the Babylonian Synagogue in Fusṭāṭ, which had been kept in the synagogue of the Jerusalemite community in 1080, were printed in Allony's *Jewish Library*, no. 80. This list includes some two dozen codices (some are parts of the same codex), exclusively of biblical texts, and all were dedicated by private persons or privately purchased. An instructive example of the dedication of a biblical text to the Karaite community for public reading is a long inscription preserved with a fragment of a few folios in MS St. Petersburg Евр. II B 225. חסן (in a document from the Geniza her name is recorded as חוסן) בת יעקב בן לעדת בעלי יוסף כשנאם ממצרים (from Cairo or Fusṭāṭ) dedicated in 1016 a manuscript of Minor Prophets מקרא הקראים השוכנים בירושלים <...> על יד אדנינו הנשיא שלמה בן דויד בן בע׳<ז> <...> וצותה להי<ו>תו בחצר יוסף בכתוי <...> יקראו בו הקהל בשבתות ובמועדים. The scribe who inscribed the dedication ended it with a regular colophon and, according to Karaite custom, used the encrypted alphabet אתב״ש to indicate his name: אני טח״ם <ש<>״ט תצג״ט ש״ט שלאף״ם> = נסי בן אהרן בן בכתוי> כתבתי הקדשה זו בצנ<ל>ו[ן]יה ביום שני בשבוע בחמשה ימים לחדש תשרי שנת אלף ושלש מאות ושמונה ועשרים למספר יונ[נ]ים בארץ מצרים. Paul Kahle published an identical dedication and colophon from MS St. Petersburg Евр. II B 22 (P. Kahle,

non-biblical) manuscripts in synagogues does not seem to have been customary in the Western communities. The scarce literary testimonies from Europe, specifically from Germny, relate to bequests of Pentateuch codices or commentaries on the Pentateuch and prayerbooks, meant mainly for teaching the young boys, and Tora scrolls for ritual reading.[129] In a responsum he wrote in Spain, Rabbi Asher ben Yeḥiel advocated that "community books should be available to the poor of the town for studying, since it would be a fault if they were to hang around idly for lack of books".[130] Thus it seems that in both Germany and Spain, books which were in communal possession were destined for the education of needy pupils. Indeed, children in both countries had to bring their own books to school, as is evident from a responsum by Yehuda HaCohen, the head of the Mainz halakhic school in the second quarter of the eleventh century,[131] and from a responsum by R. Zeraḥya HaLevy included in the responsa of R. Shelomo ben Avraham Adret (known by the acronym RaSHBa).[132] Such circumstances, in which even textbooks of the youngest students were private, elucidates in the best of ways the individualistic aspect of the production and consumption of Hebrew books in the late Middle Ages. Avraham ibn Daud writes in his *Sefer ha-qabbala* about R. Shemu'el HaNagid that he kept scribes who copied codices of the Mishna and the Talmud, which he used to donate to students who could not afford to purchase them, both in Spain and in other countries (היו לו סופרים שהיו כותבים משנה ותלמוד, ונותן במתנה לתלמידים שלא

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[129] According to the *Nuremberg Memorbuch*; see Assaf, *Mekorot*, vol. 4, pp. 12-13.

[130] *Responsa*, Vilnius edition 1885, Kelal 6, par. 25 (in Hebrew).

[131] The responsum is worded as follows: להר׳ יהודה הכהן ז״ל. ראובן הכניס בנו לבית הספר לפני שמעון ופסק עמו לתת לו לשנה כו״כ, והביא בנו לבית שמעון, **והביא ספרו ללמוד לו, וגם חביריו הביאו ג״כ ספרייהם** והיו מניחין אותם במקום מיוחד להם, עד שהשלימו הספר והתחילו ספר אחר. והניח בנו של ראובן ספרו בבית שמעון ולא הוליכו לבית אביו, ונאבד אותו הספר בבית שמעון, והתחיל שמעון לתבוע שכרו מראובן, וראובן תובע לו ספרו. היכול ראובן לתבוע דמי ספרו משכר שמעון שיש בידו או לא? (my emphasis, M.B-A) (A. Grossman, 'Rabbi Yehuda HaKohen and his 'Sefer ha-dinim', *Alei Sefer*, 1 (1975), p. 33 [in Hebrew]). See also the discussion by Kanarfogel in regard to Jewish education in the late Middle Ages. According to him, unlike the practice in Islamic countries, communities – especially in Ashkenaz – did not sponsor elementary education; teachers were hired privately by parents and even the yeshivas did not receive communal support. E. Kanarfogel, *Jewish Education and Society in the High Middle Ages*, Detroit 1992, pp. 33–65.

[132] The text of the responsum is as follows: ואשיב תחילה על ג׳ השאלות אשר רצה < ...> כה״ר שלמה קורקוס לעמוד בהם על דעתי. הא׳ הנה היא אם המלמד יש לו דין שומר הספרים שמביאין התינוקות לביתו ומוליכים אותם לביתם כשירצו < ...> תשובה אין למלמד דין שומר כלל < ...>. The responsum by R. Z<eraḥya> HaLevi is cited in the Responsa by RaSHBA, Livorno 1825, par. 166 (fol. 34v), identified as such at the end of the responsum, apparently by Ḥaim Falaji, the editor: השאלה והתשובה היא לשון הרי״ז הלוי ז״ל < ...> וכתבתיה כאן לפי שכתבה בה סברת הרשב״א ז״ל. Cited in part by N. Morris, *A History of Jewish Education*, vol. 2/1 Jerusalem, 1977, p. 146 (in Hebrew).

Even such a (היו יכולין לקנות משלהם בין בישיבות ספרד בין בארצות [אחרות].[133] hagiographic account, which cannot be regarded as historical evidence of events that had occurred a century earlier, and the alleged information reported there about books being supplied to *yeshivot* outside of Spain, which further undermine its credibility, expose in all clarity the reality of private ownership and use of textbooks and the absence of community initiative aimed at reproducing books for students. The same can be deduced from two Latin documents from Spain – the first from 1328 in Aragon and the second from 1332 in Sevilla – indicating that well-to-do Jews used to either deposit books or pay for their purchase for students in *batei midrash*.[134]

Perhaps the only extant evidence to an attempt – which did not materialize - to initiate public financing for the copying and loaning of books appears in the introduction of R. Yitsḥaq ben Yosef of Corbeil (d. 1280) to his *Sefer Mitsvot Qatan* (Abridged Book of Commandments), composed in France in 1276/7.[135] In a bold, unique step-by-step plan of action the author outlines explicitly the appropriate method for disseminating his text: Every community, he affirms, should finance the copying of his halakhic code and preserve one copy so that whoever wishes to copy or study it will be able to borrow it on a daily basis (וכל אשר ירצה להעתיק או ללמוד בו ישאלם ויחזירם בו ביום). He further

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[133] A. Ibn Daud, *Sefer haqabbalah*, ed. G.D. Cohen, Philadelphia, 1967. In his 'Sipurei Venetsia' (Venetian Stories) from 1517, Eliyahu Capsali of Crete - who lived in the region of Venice between 1508 and 1515 - narrates the private initiative (that was never to be fully realised) undertaken in the late Middle Ages in Brescia in northern Italy in order to finance the production of all the Talmud tractates for the use of yeshiva students, and for lending <them books> (and making other books available to them):
והיה קרובו של מהר״ר ר׳ יוסף קשטיל פראנקו איש צדיק תמים היה בדורותיו ועשיר מאד. והיה דר בבר״יישא יוסף ירושלמי הנ״ל, ומינהו שם לראש ישיבה <...> והיו לו יותר מארבעים בחורים מזולת תלמידים קטנים הרבה מאד. והיה הר׳ יוסף הנ״ל מאכיל ומשקה ומלביש את כל הבחורים שהיו בישיבה ההיא משלו <...> ועוד הגדיל לעשות וישם על לבו לכתוב כל המסכתות כתב יד בקלף, גמרא פירוש ותוספות, וישכור את ר׳ פרץ הסופר לכותבם לו ולתת לו לשכרו בשנה פרחים <היינו פלורינים> ל״ז ומזונותיו, ולכתוב לו ביום שעות ח׳, וביום ו׳ שעות ד׳, ויסדר קלפים יפים מאד וגדולים, ובפעם א׳<חת> נתן לאומן עושה הקלפים פרחים חמשים, ויחל לכתוב בארבעה מסכתות, והיה חפץ אשר לא נעשה כן מעולם. ועיני ראו את יופיים שהובאו מהם קצת עלים בביניזיאה <ונציה>, שהובאו משלל ברישא והיו לי למופת. והיה בדעתו להקדישם לכל מי שיחפץ בהם ללמוד בהם ולהפקירם לענניים, והיו עושים חשבון כי אלו היו נגמרים היו עולים לו פרחים ת״ר אלא שעונותינו רבו וישימום לשלל כאשר נשללו היהודים האומללים ברישא כאשר נכתוב. ועוד היו לו כמה ספרים ואת הכל נתן ביד התלמידים ולא חשך מהם מאומה.
(*Seder Eliyahu Zuta*, ed. A. Shmuelevitch, S. Simonsohn, and M. Benayahu, Jerusalem 1976, p. 258; cited from a slightly different version, according to a partial edition by Furges, already by Assaf, *Mekorot*, vol. 2, p. 110 [in Hebrew]. The citation provided by Assaf was substituted in the new edition of the book (edited by Glick) and in its computerised database according to the text cited in the Shmuelevitch, Simonsohn, and Benayahu edition). This is a unique, unparalleled source providing information about a scribe's work hours and his yearly wages.
[134] Assaf, *Mekorot*, vol. 2, p. 61.
[135] On the date of its composition see recently S. Emanuel, *Fragments of Tables: Lost Books of Tosaphists*, Jerusalem 2006, p. 198.

states that if a representative of a community should have to stay in another town in order to copy the book, he should be reimbursed for his expenses from the public fund, and even the rates are prescribed.[136] Apart from this unprecedented programme, aimed at the quick and controlled distribution of a halakhic code and ensuring its standardisation, and apart from synagogue foundations and private donations, books were the property of individuals .

Indeed, as we saw above, book-lists and inventories from the East and the West attest to the same reality. In the same way, the production of manuscripts was achieved through private initiative, as attested in various Geniza letters, and such were their distribution and sales, as seen in the list of book traders preserved in the Cairo Geniza. The private and individual nature of the production, ownership and use of manuscripts is clearly and indisputably manifest from the classification and analysis of all the colophons in Hebrew medieval manuscripts,[137] namely some four thousands, assembled by the Hebrew Palaeography Project. According to these colophoned manuscripts only very few were produced for an institution or a community, all the others having been commissioned from hired scribes (some of which were undoubtedly only casual scribes) by private individuals for their own use, or copied by the individual users themselves. Even the few cases attesting to communal ownership do not actually challenge the individual character of the production and consumption of Hebrew books. In fact these few manuscripts, all of them liturgical, were commissioned neither by the community nor by an institution, but, as explicitly indicated in most of these cases, were dedicated by private individuals to the synagogue or to the community.

Perhaps the earliest example of the production of a book destined for the public is MS Oxford MS. Mich. 436, an undated maḥzor copied in the late-thirteenth or the early-fourteenth century by a scribe who was surely named Yaʿaqov.[138] The manuscript contains a colophon by the vocalizer, Yehuda, who stated that he had vocalized this maḥzor for praying in public (in the synagogue): ואני יהודה נקדתי זה המחזור להתפלל בתוכו בקהל ועדה. In the absence of an owner's name it is likely that the vocalizer meant that the maḥzor was destined for the cantor in a synagogue rather than for a private

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[136] Assaf, *Be'Oholei Yaʿaqov*, p. 13.

[137] This number includes undated colophons in manuscripts that have not been documented or located yet, but were recorded based on microfilms or catalogues. Some 50 colophons of manuscripts that have not survived were preserved in copies of later manuscripts.

[138] Neubauer Catalogue 1025; see also the entry in the Neubauer & Beit-Arié Catalogue.

person's prayers. In connexion with this, one should recall the first volume of the well-known Worms prayer book, copied at the beginning of 1272. That monumental, hefty, illuminated and illustrated Maḥzor had certainly not been produced for private use. Yet, like other sumptuous German colophoned maḥzors, it had been copied upon the commissioning of a private individual. The colophon inscribed by the copyist of the Worms Maḥzor might possibly allude to the fact that the childless owner wished to have the book made and left in possession of the public so that his departed soul might be exalted in prayer.[139] The triple rhyme in Yiddish, inscribed by the scribe's hand in the empty spaces within the contours of the initial- word characters, בדעתו, in fact the very first written evidence of this hybrid language, confirms this interpretation as it contained a blessing for whoever carried the Maḥzor to the synagogue.[140] Whatever the case may be, it is clear that the production of this deluxe codex, which must have been intended for the use of cantors in the synagogue, was the product of private initiative and was kept by the person who had commissioned its copying, vocalization, and illumination.

An explicit dedication of a maḥzor to a Ferrara synagogue was written by its scribe in 1469, and it seems this is the earliest dedication to survive in a non-Karaite book. The person who commissioned the book, Yaʿaqov ben Elia, dedicated it to the synagogue as long as everyone Jew be allowed to use it there, but no one, neither "man nor woman", be allowed to take it out of the synagogue unless permitted by those in charge[141] (בתנאי זה שכל ישראל יכולין לקרות בו בבית הכנסת הנז׳ ולא יוכל שום איש ואישה

קטון וגדול להוציאו מבית הכנסת <...> כי אם ברשות ובהסכמת הפרנסים והממונים).
The earliest extant example of copying a codex explicitly intended for the public is dated 1363 and is connected to a Karaite community. Indeed, Karaites had an old tradition of donating privately owned Tora scrolls and biblical codices to synagogue foundations. As a matter of fact, this case does not really fit our discussion since it concerns not a codex but a Tora scroll, obviously meant to be used in a synagogue. This

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[139] For a detailed description, see Beit-Arié, 'Worms', pp. ix-xxvi. For the formulation of the colophon and its interpretation, see ibid., p. xi.

[140] See C. Shmeruk, 'The Versified Old Yiddish Blessing in the Worms Maḥzor' in *Worms Mahzor, Introductory Volume*, pp. c-cii.

[141] MS London, Valmadonna 10: see B. Richler (ed.), *The Hebrew Manuscripts in the Valmadonna Trust Library*, London, 1998, no. 103, pp. 61-63.

ritual scroll, kept in St. Petersburg, is unique in that, unlike rabbinical ritual scrolls, it displays a colophon at its end. There the scribe indicated that he produced the scroll for Eliyahu ben Yaʻaqov and for his sister פוסירא, so that it be dedicated to the community of כוכסו.[142] From the end of the fifteenth century a colophon without its manuscript – which had presumably been a biblical book – has survived, copied in the Orient by a Karaite scribe who, in 1490/1, made the copy for an owner who dedicated it to a the synagogue.[143]

Two Yemenite manuscripts of the late fifteenth century were specifically inscribed for a synagogue, both of them in Sana'a. One contains the Hagiographa and, according to its colophon, was copied in 1484/85 by Yosef, son of Benaya who had been the most renowned scribe in Yemen,[144] for the synagogue. However, at the head of the manuscript the scribe wrote an inscription in large characters, indicating the name of the individual who financed the copying.[145] The other manuscript, a non-liturgical one (Maimonides' commentary to the Mishna in Judaeo-Arabic), contains no mention of the

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[142] MS St. Petersburg Евр. I A 35 (Harkavy & Strack Catalogue, p. 220). The Sefer Tora was inscribed in כוכסו, which may be identified with Kukes / Kokes (known also as Serik) in Antalya, Turkey. Years later the same scribe, Yehuda ben Eliyahu of Adrianopolis, was active in Crimea: he inscribed a dedication in a Tora scroll donated to the synagogue of the Karaite community in Solkhat (Staryi Krym) in 1389/90 (MS New York, Columbia X893 B4776). Among non-Karaite Tora- and other liturgical scrolls, I am familiar with only one later scroll of the Book of Esther ending with a brief colophon, though inscribed at the end of the blessings that were copied after the text: MS Parma, Parm. 3318 (De-Rossi Catalogue 320, Richler & Beit-Arié Catalogue [Parma] 414), whose copyist completed it in 1479/80 and signed his name with the acronym אפ״י, an abbreviation of the name of the famous scribe (and author) Avraham Farissol, whose copied Hebrew manuscripts are the largest in number. Avraham Farissol used this acronym in several colophons he wrote, and it should be read as אברהם פריצול יי״ץ. The blessing formula יי״ץ for a living person (perhaps ישמרהו צורו? [may his Rock protect him], cf. the formula יצ״ו in chapter 2, section 1, Blessings), although attested initially in Ashkenazic colophons, was common in Italy especially in the latter half of the 15th century, and it was the blessing formula preferred by Farissol when recording his name, as evidenced in his 25 colophons. The fact that the scroll was ink-ruled (the margins were ruled in pencil), in the style that was common in Italy during the last decades of the 15th century and not in accordance with the halakhic requirement of colourless ruling, indicates that Farissol wished to make clear that this scroll was not intended for liturgical use in the synagogue, but only for following the reading, and therefore he did not refrain from inscribing a colophon after the blessings. On an early Sefer Tora with a colophon inscribed at its end see below, chapter VII, n. 31,
[143] The person who commissioned the manuscripts for dedication to the synagogue, Shemu'el ben Yehuda HaCohen ibn Alcazan, is known to us as a Karaite sage who in 1502 copied three Judaeo-Arabic manuscripts for his own use (MS New York MS 1405, MS St. Petersburg Евр.-Араб. I 1781, and MS St. Petersburg Евр.-Араб. II 1868, copied in Cairo).
[144] On the scribe Benaya and his family of professional copyists (sons, grandsons, and even great-grandson), see below, chapter 2, n. 141, as well as my note in *Manuscrits médiévaux*, II, 112*.
[145] MS Jerusalem, Private collection of M. Benayahu (offered for sale by Sotheby's auction house in New York, December 19, 2007); see the description of the manuscript in in *Manuscrits médiévaux*, Part III, 118.

patron who commissioned the copying or the scribe. The short colophon only indicates that the copy was completed in 1496/97 for "the holy synagogue".[146]

No doubt, the direct evidence of colophons, which are authentic historical documents, more reliable than shifty literary texts, indicates that Hebrew books in the Middle Ages were the product of individual rather than communal enterprise. Even in the few cases in which books were produced for use in the synagogue they were not initiated or financed by the community but by individuals who donated them to the public.[147]

It should be emphasised that the colophons in no way attest to the commissioning of manuscripts by book dealers. While book-lists found in the Egyptian Geniza do confirm the existence of dealers, there is hardly any evidence, not even in halakhic literature, of their presence in Europe.[148]

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[146] MS New York R 1624.

[147] See the remarks by Robert Bonfil on the social function of synagogues in Europe and their role as public libraries – statements founded, however, on rather scant evidence: R. Bonfil, 'La lettura nelle comunità ebraiche dell'Europa occidentale in età medievale', in *Storia della lettura nel mondo occidentale*, ed. G. Cavallo & R. Chartier, Rome–Bari 1995, pp. 174–176. Bonfil admits that documents concerning the depositing of books in synagogues are rare, and mentions a few: an inventory of books deposited in a synagogue in MS Vatican Urb. ebr. 22; a record of a bequest of a four volume Bible to the synagogue in Padua, published in 1907; and also Sonne's view about a list of books from 1445, which, according to him, could be considered as a kind of Renaissance public library, a precursor to the library founded in 1452 by Cosimo de' Medici: I. Sonne, 'Book Lists Through Three Centuries', *Studies in Bibliography and Booklore*, 2 [1955–1956], pp. 7–9.

These examples presented by Bonfil to ground his view invite the following comments: the book inventory in the Vatican manuscript is nothing more than a list of privately owned books that were deposited by the owner's nephew in the synagogue, surely for temporary safekeeping: שאשים כל הספרים בבי״ה שהם מכמ״ר יצחק דודי יזיי״א מטיבולי. The manuscript in which the books were listed was copied in 1433. The name of the copyist, who had prepared the copy for his own use, was erased in the colophon, but the name יצחק was highlighted within the text, and therefore it appears that his name was Yitsḥaq. Indeed, the name of the copyist of MS Firenze, Bib. Laurenziana Plut. I 50, inscribed in similar script and copied at around the same time (in 1433), and which codicological features are identical to those of MS Vatican, is Yitsḥaq ben Yequti'el, who copied it for his own personal use. Yitsḥaq ben Yequti'el was indeed the owner of many books – in MS Florence as well a list of books he owned was appended to the end: מערכת הספרים אשר הוצאתי מחדר הר׳ יצחק יש״ר בכ״ר יקותיאל (Eventually a note was added to the end of the list: < ...> בחדר ר׳ יצחק זולת <...> הספרים חזרתים). The list of 33 books was published by Rothschild, 'Listes des livres en Italie', no. 1 (pp. 294-298). The list of books from 1445, published by Sonne, is simply one of many lists of a private library. The will bequeathing the Bible to the synagogue belongs together with other evidences of bequeathals of biblical books to synagogues. The mere accumulation of biblical books in synagogues does not designatee synagogues as public libraries.

[148] At least according to the search in the database of halakhic literature of Bar Ilan University's Responsa Project, according to keywords such as ספרים. We should not be misled by the wording of the colophon in MS Parma Parm. 2406 (De-Rossi catalogue 481; Richler & Beit-Arié 1242), copied, with no indication of date, by Yeḥi'el ben Moshe around the fourth decade of the 14th century (according to MS Dresden, Landesbib. Msc. Ea. 140a which he copied for himself in 1332 in Perugia, excluding the last two quires which he copied in Amandola, Southern Italy). In the Parma colophon he states having copied it for 'a shop' or 'the shop' in Amandola ('shop' signifying a bank or money-lending business – as it was referred

The individual character of the manuscript book production, as well as its consumption, is solidly attested by the direct and indirect testimonies of some four thousand medieval colophons which indicate that at least half the manuscripts were user-produced, namely - copied for one's own use.[149] In fact, only twenty nine percent of the colophons contain explicit or implicit indications that the manuscript had been produced by its copyist for his or her own use.[150] Evidence for user-production is present already in the colophon of one of the earliest dated manuscripts, copied in Gaifa in Egypt in the year 953/4;[151] but the numbers of extant dated manuscripts which were user-produced began to increase from the middle of the thirteenth century and onward. Thirty eight percent of the colophons state explicitly that the manuscripts had been commissioned by private patrons to be copied by hired professional, semi-professional, or casual scribes; thirty three percent of these thousands of colophons do not contain an indication as to the copy's destination. The argument I wish to propose is that in most instances where copyists did not state in their colophons whether the manuscript was intended for his/her private use or for the use of another party, or in cases in which a neutral statement discloses no information on the copy's destination – the majority of such books would have been user-produced. It is hardly conceivable that a hired scribe would refrain from mentioning in his colophon the person who had contracted him for the copying for such mention had legal significance too, as proof of possession of the valuable object. And, on the other hand, it stands to reason that a learned individual and certainly a learned

to by Italian Jews, and not a bookshop; see U. Cassuto, *Gli ebrei a Firenze nell'étà del Rinascimento*, Firenze 1918, p. 168). It seems that the copyist was commissioned by proxy for a certain money-lender in Amandola. See as well the vocalizer's colophon dated 1468 in MS Oxford MS. Can. Or. 22, where confirms having received his pay from Yehoshu'a, bank manager מנהיג חנות in Castello; see N. Pasternak, Together and Apart, p. 423, no. 10.

[149] These dates pertain to all the colophons, as explained above, n. 137.

[150] In calculating the ratios of the destinations, secondary copyists who did not provide their own colophon were not taken into account. Apparently they could be defined as copyists working for others. However, for determining the destination of a manuscript, the testimony of the main copyist takes precedence. On the other hand, this calculation also includes manuscripts copied for a relative, the ratio of which amounts to more than three percent. It would seem that these manuscripts should be classified as user-produced manuscripts. When the destination of a copy is not made explicit in the colophon, it may be deduced mainly from the fact that the conventional wishes for the owner of the manuscript – that he may enjoy the privilege of studying the book, along with his offsprings, and so on – are self-addressed, and also, based on paratextual notes added by the copyist, such as records of birth. The exact data presented below are based only on the most reliable corpus of colophons in the dated manuscripts documented in situ.

[151] Of a manuscript of four books of Prophets, with Babylonian vocalization and cantillation, only two damaged folia have survived in the Cairo Geniza. See *Codices hebraicis*, Part I, Manuscrit 9.

scholar copying for his own use would not necessarily bother to disclose his or her identity.

Notwithstanding, it is likely that not all unaddressed colophons were by persons making copies for themselves and one can hardly surmise that some sixty-two percent of the manuscripts were user-produced. Some of these manuscripts, especially those containing highly demanded and much-used texts, such as Bibles and prayerbooks, might have been prepared by professional scribes even without prior commissioning, on the assumption that they would be purchased by chance buyers or perhaps book dealers. Indeed, an explicit example of such circumstances survived in the colophon of MS Rome, Biblioteca Casanatense 3104, a Sefardic fifteenth-century manuscript containing a kabbalistic compilation: here we read the scribe's statement that he copied the book for anyone who would purchase it (כתבתי זה הספר של ליקוטין ועניינים אחרים יהודה בן אבה <...> נאם אשתרוק בן **למי שירצה אותו לקנות** של קבלה).[152] Likewise, one can assume that if a renowned and prestigious artist-scribe like Yoʻel ben Shimʻon copied and illustrated a Passover Haggada without sealing it with a colophon, it had obviously not been commissioned by a specific patron but sold to a dealer or possibly commissioned by him beforehand[153] Similarly, if we find an unaddressed manuscript

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[152] See also Beit-Arié, 'SFARDATA', pp. 167-168, and cf. idem, *Makings*, pp. 43-33; idem, 'Colophons', pp. 500-501. Naturally, the data in these publications would vary somewhat because of the progress achieved in the documentation. The distribution of these data is not uniform throughout all regions. In Ashkenaz, for example, only 21% of colophoned manuscripts were user-produced (in the 13th century only 10% and in the 15th century – 27%), 43% were commissioned, while 35% were unaddressed. In Italy, 44% of the copies were commissioned. In Yemen only 18% of the colophons werere unaddressed and only 13% of the manuscripts were made for personal use, while the proportion of manuscripts that hired scribes wrote for others was as high as 72%! This said, based on the premise put forward below, that most of the unaddressed manuscripts were copied by learned individuals for their own use, the ratio between commissioned manuscripts copied by hired scribes and those produced by scribes for their own use are quite similar in all regions, with the exception of Yemen, where more than two-thirds of book production were commissioned. The ratio of unaddressed manuscripts together with those made for personal consumption in all regions (except Yemen) ranges from 56% (in Italy and Ashkenaz) to 78% (in the Middle East); in Spain and Byzantium their ratio is 68%. .

[153] Three of nine extant colophons copied (and illustrated) by Yoʻel ben Shimʻon in Germany and Italy in the years 1449-1485 are unaddressed; to these should be added three uncolophoned manuscripts that have been positively identified as his. All of them contain the texts which were most popular or in demand, namely, haggadot or prayer books. Therefore, the information in this regard should be corrected in my article M. Beit-Arié, 'Codicological Description and Analysis of the Washington Haggadah', in *The Washington Haggadah: A Facsimile Edition of an Illuminated Fifteenth-Century Hebrew Manuscript at the Library of Congress Signed by Yoʻel ben Shimʻon – Commentary volume*, ed. M.M. Weinstein, Washington 1991, pp. 105–106 [=idem, *Makings*, pp. 216-271]. MS Jerusalem Heb. 4° 1384,

copied by a professional scribe who had been copying manuscripts for individuals other than himself, it would seem highly probable that the manuscript in question were copied for a chance buyer. While it stands to reason that upon selling a manuscript to a chance buyer the scribe would add a colophon attesting to the sale and ownership, it is equally possible that the book would eventually be sold by someone other than the scribe. Indeed, it is possible to interpret another two dozen unaddressed colophons as having been inscribed for chance buyers, mainly by referring to abstract patrons[154] or by the empty space left for inserting their names at a later stage, or by the addition, by the scribe of a unaddressed manuscript, of a deed of sale mentioning the buyer's name, shortly after the date of the colophon.[155]

If our assumption is correct then – whether most of the unaddressed manuscripts were user-produced copies, or whether they were produced in view of selling them to chance buyers – the high rate of user-production in Jewish societies as reflected in the corpus

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which has since been identified as his own doing, should be added to the manuscripts listed, ibid., pp. 127-128 [=pp. 238-293]; see below, chapter 2, n. 108.

[154] As, for instance, שׁי ברחמיו יזכה לאדון הספר הזה להגות בו ובשאר ספרי הקדש (a manuscript of Recanati's commentary, copied in Bologna in a Sefardic script in 1399, in possession of the Recanati family, Tel Aviv).

[155] Avraham ben Moshe of כזריא, for example, wrote a long unaddressed colophon at the end of a manuscript he copied in Byzantium in 1402. Four months after inscribing the colophon he sold the manuscript and wrote a detailed sale deed at its end (recently the manuscript was in the possession of a book dealer in Jerusalem). In MS Paris Hébreu 237 (Manuscrit *datee*, Part I, 95) also copied in Byzantium (Kastoria in Macedonia, Greece) in 1437, and contains sermons on the Tora by Yehoshuaʻ Ibn Shuaib, the scribe noted as follows: הדורות ומי ששכרני וכתבתיו לו השׁי יזכהו להגות בו הוא ובניו ובני בניו עד סוף כל. The unspecific mention of the manuscript's addressee indicates that the copy had been prepared for a chance buyer, or else that the scribe had been commissioned by a middleman without knowing the name of the buyer. The scribe subsequently added at the end of the manuscript a kind of brief address to Avraham, indicating that he had sold the manuscript to him, thus presenting him as one who had commissioned it (or was he perhaps the anonymous individual who had commissioned it in the first place?). A florid, rhymed colophon, undated, which meaning remains obscure, at the end of MS Vienna, ÖNB Cod. Hebr. 38 (Schwarz Catalogue [ÖNB] 13) – a liturgical reading corpus containing, as customary in Ashkenaz, a Pentateuch, Scrolls, and *Haftarot* (readings from the prophets), copied in Germany in the 14th century – seems also to allude to a copy prepared in advance for a chance buyer, by whom the copyist expected to be paid: מתן סתר, תנו יותר, לזה עופר, נתן ברבי אליעזר הסופר, מכתת אפר, ימצא בו שכירותו, וענתה אומנותו, אשר ממנו יקפוץ ידו, פתאום יבא אידו, והאיש אשר יתן לו, בארץ החיים יהי חבלו. An example which may attest to the copying of a text for a chance buyer, even at a later period, appears in a colophon from 1582 in MS Paris Hébreu 865, copied by Asher ben Kalonymus in Ashkenazic script. At the end of a copy of the work *ʻAsis rimmonim* – an abridged version of Moshe Cordovero's *Pardes rimmonim* composed by Shemuʼel Gallico and first printed in 1600/1 – the copyist noted that it had been copied for anyone who might wish to buy it (לאיש אשר יחפץ ביקרו לקנותו).

of colophons,[156] namely, at least half of the medieval manuscripts, is unequalled in other civilisations of the codex, particularly in Christian societies. Moreover, the possibility that a large proportion of the tens of thousands of uncolophoned Hebrew manuscripts preserved in their entirety were also user-produced cannot be precluded. If this hypothesis is correct, then the phenomenon of user-production in Jewish society was even more prevalent. And yet, it must be stressed that the distinction between the learned owner-copyist and the hired scribe becomes blurred in cases in which such owners (at least at a certain stage of their lives) had been copying for others as well, as is evidenced in quite a few manuscripts (in Italy especially); or when scholars served also as salaried scribes, as in the exemplary case of Yeḥi'el ben Yequti'el ben Binyamin HaRofe – a late- thirteenth-century Italian author, who produced the Leiden Universiteitsbibliothek's copy of the Palestinian Talmud as well as other manuscripts.[157] Indeed, these data reflect the degree of literacy in Jewish society, and

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[156] In this regards the halakhic ruling by Rabbi Asher ben Yeḥi'el should be taken into consideration for it may reflect the basic attitude of rabbinic scholars in Germany, France, and Spain toward copying for one's personal use, which may have been accelerated for halakhic reasons. In relation to Maimonides' ruling that every Jew is commanded to write his own Tora Scroll (*Mishne tora*, Hilkhot Tefillin u-Mezuza ve-Sefer Tora 7:1), based on Rav's statement cited in the Babylonian Talmud, Sanhedrin 21a (cf. Rav's statement in Menaḥot 30a), Rabbi Yeḥi'el re-interpreted the commandment on early generations to write a ritual Tora Scroll as a contemporary commandment to write a Pentateuch in the form of a codex, including the writing of talmudic and exegetical literature for study purposes: וזהו בדורות הראשונים שהיו כותבים ס״ת ולומדים בו. אבל האידנא שכותבין ס״ת ומניחין אותו בבתי כנסיות לקרות בו ברבים מצות עשה היא על כל איש מישראל אשר ידו משגת לכתוב חומשי התורה ומשנה וגמרא ופירושיי להגות הוא ובניו (*Halakhot qetanot*, [Menaḥot], Hilkhot Sefer Tora, passage 1). Presumably, in referring to 'first' generations (דורות ראשונים), Rabbi Yeḥi'el had the talmudic era in mind, when the Pentateuch would be copied for study purposes still in the form of a scroll, sharing the same form as that of the liturgical Tora scroll. For the commandment that every person write a sefer tora, see Y.S. Shpigel, *Chapters in the History of the Jewish book: Writing and Transmission*, Ramat Gan, 2005, pp. 21-22, which, however, does not cite Rabbi Yeḥi'el's instructive statements. *Sefer ha-ḥinukh* similarly expands the applicability of the commandment: ודע בני, שאף על-פי שעקר החיוב דאוריתא אינו רק בספר התורה, אין ספק שגם בשאר הספרים שנתחברו על-פירוש התורה (*Sefer ha-ḥinukh*, ed. H.D. Chavel, Jerusalem 1962, passage 613). On this matter J. Hacker commented in his article 'Public Libraries of Hispanic Jewry in the Late Medieval and Early-Modern Periods', in *From Sages to Savants: Studies Presented to Avraham Grossman*, ed. J. Hacker. B.Z. Kedar, and J. Kaplan, Jerusalem 2010, p. 268 (in Hebrew). On the identification of the author, who apparently composed this work at the beginning of the 14th century in Barcelona, and was a disciple of Shelomo ben Adret (RaSHBA), see the references in J.D. Galinski, 'On Popular Halakhic Literature and the Jewish Reading Audience in Fourteenth-Century Spain', *JQR*, 98.3 (Summer 2008), p. 319, note 44.
[157] See below, chapter 13, following the reference to n. 40. Also worthy of consideration are Nurit Pasternak's findings regarding the blurring of the distinction between producer and consumer in Hebrew book production and consumption in late 14th-century Italy and especially in the 15th century, when individuals copying for themselves or for relatives, or even for their livelihood, eventually would also commission hired scribes, see N. Pasternak, 'The Judaeo-Italian Translation of the Song of Songs and Ya'aqov da Corinaldo', *Materia Judaica*, 10 (2005), p. 275; Pasternak, Together and Apart, pp. 89-94;

moreover they also contain far-reaching implications for understanding the nature of transmission of the Hebrew text. No doubt the colophons provide evidence that the scholars and literati who copied books for their own use did not hesitate to imprint their personal stamp on the texts, while intervening consciously and critically in their transmission.[158] It is perhaps possible to use the term 'copyist' to designate those who would copy for their own use and to use the term 'scribe' for a hired/paid/salaried copyist, whether a professional, semi-professional, or a casual one.

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idem., 'Who Were the Hebrew Scribes in Renaissance Italy?: A Short Review of their Manifold Roles' in *Manuscrits hebreux et arabes: Melanges en I'honneur de Colette Sirat* (cf. above, n. 95), pp. 29-37.

[158] See below, chapter 13, in the section: Private production and its impact on the transmission: learned copyists vs. hired scribes. See also Beit-Arié, 'Publication of Literary Texts'.

Tables 11-13: Distribution of production destinations and the ratio of user-production versus commissioned production

For the basis of the statistical calculations in this book, see above, in the introduction, the section titled 'General statistics of the database' (preceding Table 5).

Table 11: Regional distribution of production destinations of manuscripts dated until 1540

no. of manuscripts   % percentage out of regional corpus

Zone	For personal use or for a relative		Commissioned		Unaddressed	
	#	%	#	%	#	%
Sefarad	203	34	191	32	201	**34**
Ashkenaz	77	21	157	43	126	**35**
Italy	289	29	439	44	261	**26**
Byzantium	100	36	90	33	87	**32**
Orient	108	27	86	22	201	**51**
Yemen	13	10	93	72	23	**18**
Unidentified	6	23	9	35	11	**42**
Total	796	**29**	1065	**38**	910	**33**

Table 12: Chronological distribution of production destinations in manuscripts dated until 1540

no. of manuscripts   % percentage out of corpus for the period

Period	For personal use or for a relative		Commissioned		Unaddressed		Total in corpus
	#	**%**	**#**	**%**	**#**	**%**	
894/5 (?)	0	0	1	100	0	0	1
901-1000	1	9	7	64	3	27	11
1001–1100	6	15	13	33	21	53	40
1101–1200	10	15	15	22	43	63	68
1201–1300	49	20	112	46	83	34	243
1301-1400	187	31	230	38	180	30	600
1401-1500	414	29	570	41	418	30	1406
1501-1540	129	32	117	29	162	**40**	408
Total	796	**29**	1065	**38**	910	**33**	2777

Table 13: User-production versus commissioned production

Assuming that most unaddressed manuscripts were copied for personal consumption, they were counted in this table together with manuscripts produced for personal or for a relative.

no. of manuscript   % percentage out of regional corpus

Zone	Personal use or for a relative or unaddressed		Commissioned		Total
	#	**%**	**#**	**%**	
Sefarad	404	68	191	32	**598**
Ashkenaz	203	56	157	43	**361**
Italy	550	56	439	44	**989**
Byzantium	187	68	90	33	**276**
Orient	309	78	86	22	**398**
Yemen	36	28	93	72	**129**
Unidentified	17	65	9	35	**26**
Total	**1706**	**62**	**1065**	**38**	**2777**

It is impossible to discuss the individual mode of production of the Hebrew book while overlooking two phenomena which may appear to have been collective copying. The first is that of multi-handed manuscripts and the second – that of the scarce amount of manuscripts copied in *yeshivot* and *batei midrash*. Despite the compelling testimony of colophons regarding the private and personal production of books – either by scribes hired personally by private patrons or by means of copying for oneself, nine percent of the dated codices until 1500 (and somewhat less until 1540) have been found to have collectively been copied by several scribes.[159] It is not unlikely that the incidence of multi-handed manuscripts among the tens of thousands of undated ones is even higher. In such manuscripts we find anywhere between two to seven hands, but usually no more than three. The proportion of multi-handed manuscripts is greater in Ashkenaz and lower in the Middle East, particularly in Yemen.

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[159] On this phenomenon and the ways that it enables us to distinguish and differentiate between hands, see below, chapter 10.

Do these copies imply, despite of the absence of historical documentation, some kind of institutional or collective production of books? Do they attest to the existence of multi-scribed ateliers which produced and marketed books on a large scale? It seems that both possibilities should be rejected, the main proof being that multi-handed copies are found among both commissioned and user-produced copies. If we consider most of the unaddressed manuscripts as user-produced ones, we shall find that shared copying was more common in manuscripts that one copied for oneself. No wonder, for the value of copies that lacked uniformity was diminished, at least in Ashkenaz. Rabbi Meir ben Baruch of Rothenburg, in a responsum to the question whether a scribe hired to copy a whole book was allowed to interrupt his work, expounded why he could not do so: אפיי פועל הוא שהשכירו לזמן מרובה אעפי״כ אינו יכול לחזור בו דהוה ליה כדבר האבד שהרבה מזיק לספר שהוא משתי כתיבות.[160] Namely, the halakhic ruling states that introducing a second hand in the copying decreases considerably the book's value. Moreover, almost without exception, additional hands which joined the main scribes were not alluded to, let alone named, in the colophons of multi-handed manuscripts. It appears therefore that the anonymous copyists who shared the the work were relatives of the senior copyist who wrote his personal colophon at the end of the book, or apprentices – in the case of

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[160] Meir ben Baruch of Rothenburg, *Sefer she'elot u-teshuvot*, ed. R.N. Rabinowitz, [Lvov], 1860, passage 123 (folio 8b). This responsum is also cited in other halakhic sources. See also the responsa of Meir ben Baruch of Rothenburg, passage 833 (cited in Assaf, *Mekorot*, vol. 4, p. vi) שכיר חוזר בו בחצי בו. היום <בבלי ב״מ עז ע״א> ואם קבלן הוא, שקבל עליו ללמד מסכת לנער או לכתוב ספר בקבלנות, אינו יכול לחזור. In this context, one ought to mention the text of the colophon written by Barzilai ben Ya'aqov HaLevy, who, in 1282 in Narbonne, produced a decorated and handsome two-volume copy of the 14 books of *Mishne Tora* for Yosef ben Avraham Shelomi (MS Amsterdam, Ets Hayyim Library A 1-2). The text of the colophon indicates that it was copied by one hand: **כתיבה אחת ומדה אחת קצב אחד לכלם** (see the following photo).

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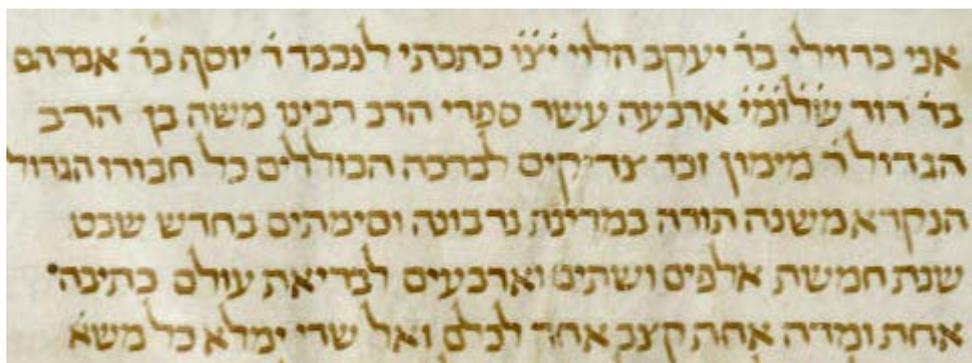
copies by professional hired scribes – or relatives and pupils of scholars who needed a copy for their own use.[161]

During the fifteenth century some two dozens manuscripts were copied in *yeshivot* (or *batei midrash*), most of them Sefardic. The majority of these were copied in Spain, all but one dating from the second half of the century, before the expulsion; a few were copied in Southern Italy, and, after the expulsion from Spain, in Morocco and

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[161] The colophon of MS Oxford MS. Opp. 418 (Neubauer Catalogue 1595), inscribed later - at the time of the spread of the printing press - in Roseheim, Alsace, is instructive: the third copyist's account of hiring a relative to take over his deceased father's unfinished work, then completing the copying himself sheds light on multi-handed manuscripts and on the absence of scriptoria in Jewish society: סליק ספר נכבד ומהודר <...> וכאשר אבא מורי התחיל לכתוב אותו, צרכי ציבור מנעו אותו ממלאכתו, גם הוא גם אני במלאכתי לשקוד יום יום על דלתותי, עד ששכרתי את שאר בשרי האלוף כמ״ר <...> לכתוב מה שחיסר אבא מורי <...> וכאשר כתב נלאה גם הוא. ואני העלוב כגבר חלצי אזרתי, ואל המלאכה הקדושה קרבתי, תנומה לעיני לא נתתי, עד שבעזר וסיוע האלהי הספר הקדוש גמרתי. Indeed, three different hands can be identified in the manuscript: fols. 8-86 (the father's hand), 87-188 (the hired relative), 189-357 (the son). This late colophon reflects the personal character of Hebrew book production and, moreover, its private bearing: producing for one's own needs and engaging family members to collaborate. MS London Or. 1084 (Margoliouth catalogue 920), which contains a selection of the writings of Yitsḥaq ibn Latif, illustrates a similar phenomenon of an owner who copied privately and hired a professional scribe to complete his work: fols. 18r-56r were inscribed by Binyamin ben Yo'av, who copied for himself in a fairly sloppy and disorderly semi-cursive Italian script (the ruling of the manuscript was produced by folding the quire folia) and finished copying in 1413 (according to the colophon he inscribed on fol. 55v). After copying fol. 56r he reconsidered and stopped his work, leaving the final folio of the quire empty (fol. 57). On the verso of that folio he inscribed a rhymed colophon telling about time pressures that led to the hiring of a copyist: ויהי כשהזמן עלי העיק, כעגלה המלאה עמיר תעיק, מסרתי פעולתי לידי מעתיק, ורצון ה׳ בידי הפיק. Indeed, the copying continues (fols. 58r-95v) on separate quires numbered consecutively, following the quires copied by the manuscript owner. Here the watermarks are different from those of the first section and the script is a Sefardic semi-cursive. This part was completed within the same month. The professional scribe did not indicate his name in the colophon but his unique hand and his graphic habits are recognizable in a number of copies, all anonymous, copied in Bologna between 1397 and 1401 (hence the reference to him in SfarData as הסופר מבולוניה). The same owner-copyist, Binyamin ben Yo'av, copied MS Paris Hébreu 814 in his same hand, about a year earlier while in jail in Bologna (See *Manuscrits médiévaux* I, 79). Another example of handing the manuscript to be completed by a hired scribe is MS Paris Hébreu 162, a collection of commentaries on Prophets and Hagiographa, copied in Italy in the early-14th century (before 1341/2). At the end of the commentaries to Prophets, on a blank page (fol. 174v), a brief text describes the transfer of hands in the copying process: ליד ר׳ שמואל אחי ב״ר בנימן מני מנחם אחיך עוד אודיעך כי נתפשרתי עם ר׳ משה הסופר שישלים לי זה הפירוש בכ״ב פרו׳ הקונטרס ואני שלחתי על ידו ט׳ קונטרסים והא׳ היה כתוב ואם נתפשר עם הגוי והחזיר לי ענייניו. Indeed, the commentaries for Hagiographa (fols. 175-288, which comprise eleven quires, according to a new quire numbering, and not nine as indicated in the text) were copied by a different scribe whose name is disclosed on fol. 245v by the acrostic משה. This example contains information otherwise rare in European Hebrew sources about the fee of a professional scribe calculated by the quire. *Sefer Ḥasidim* too dwells on the calculation of a professional scribe's fees when mentionig a discreet way of increasing the needy scribe's pay: אדם רצה ליתן לחבירו צדקה בלא בושת, קונטריס שאחרים כותבין בארבעה היה נותן לו ששה. והיה כותב טעיות הרבה. אמר החכם : אין לך זכות באותה צדקה, שכל מה שכותב מלא טעיות (*Sefer Ḥasidim*, passage 887).

Palestine.[162] Nonetheless, they do not undermine the basically individual character of Hebrew book production and consumption: Almost all of them were copied by single hands, that of *yeshiva* students, either for themselves or by private commissioning (in three cases for the head of the *yeshiva*), and they do not differ from other manuscripts in which copyists generally did not indicate the location of copying. In fact, from the scarcity of manuscripts copied in talmudic academies it can be inferred that these were not used as centres of copying. In addition, the fact that the manuscripts were not copied for the *yeshiva*, except for those copied for the head of the *yeshiva*, reinforces the individual facet. Indeed, a few multi-handed codices were copied in those centres of learning, tempting us to regard them as collective products of a scriptorium located in institutions of this kind. Yet the phenomenon of multi-handed production was not limited to those manuscripts only, and in any case the evidence is so negligible that one must not embark on such conclusions.

It seems that the conclusion to be drawn from textual sources and documents as well as from the large corpus of colophons found in the extant medieval manuscripts is unequivocal: that the production of Hebrew books in the Middle Ages had never been the product of an institutional initiative, be it by the community, by the spiritual leadership or by centres of learning, but always the outcome of private enterprise. They were no scriptoria in centres of Tora learning and no commercial ateliers which manufactured and marketed books on a large scale. Book production and text reproduction were performed by individuals, either professional scribes hired by patrons, or learned individuals copying for their own personal use. Both would sometimes be assisted by subordinate copyists – presumably relatives or the senior scribe's apprentices/pupils. Like the *yeshivot* (the Jewish learning centres equivalent to the monasteries, cathedral schools and universities of the Christian world) which, in

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[162] See my introduction to the Neubauer & Beit-Arié Catalogue, p. xxi, n. 1. See also M. Riegler, 'Were the Yeshivot in Spain a Centre for the Copying of Books?', *Shenaton haMishpat ha'Ivri*, 18-19 (1992-1994), pp. 411-426 (in Hebrew). The oldest surviving manuscript copied in a *yeshiva* is MS Paris Hébreu 976, copied in Rome in 1311/2 יואב <...שלהרב מדרשו בבית בלמדי. To the manuscripts from outside Spain mentioned by Riegler (ibid., p. 415, n. 22) should be added a manuscript copied in Montalto in Italy in 1493 and two manuscripts copied by one scribe for one owner in Kashan (Iran) in 1494 and 1496 in the *yeshiva* of Rabbi Hashem ben Shemu'el HaLevy. The fact that a number of manuscripts had been copied in synagogues appears to be irrelevant to this discussion. These manuscripts were copied for private use and it seems that their copyists found this a convenient venue for their work. On two of these, copied by a single scribe in Seville, see *Manuscrits médiévaux* III, 3 and my notes, ibid.

Western Europe were private institutions, owned by the rabbis heading them and having no formal affinity to the community,[163] so were the production, dissemination and keeping of books a private enterprise. Like the autonomy exercised by each Jewish community, especially in Europe, and the lack of centralised civic or halakhic, let alone political, authorities in the dispersed Jewish society of the Middle Ages, so were the texts reproduced and propagated without supervision or monitoring, through private channels, and, naturally, no standardisation of their versions could have been imposed.[164] The individual nature of book production and consumption did not give rise to public libraries even at the end of the Middle Ages, apart from modest collections of donated or bequeathed biblical and liturgical books in synagogues. Hebrew books were not produced and kept in centralised and collective frameworks, as Latin books were in ecclesiastic institutions, nor were they assembled and preserved in institutional libraries but in many private collections especially in what concerns the Middle East (in earlier periods[165]), then Italy and Spain. Making, using, collecting and keeping books in Jewish societies was indeed an extraordinarily private undertaking.[166]

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[163] I am grateful to Mordecai Breuer for enlightening me concerning the status of *yeshivot* in Western Europe and their rapport to the character of Hebrew book production, which differs from the character of Latin book production. See also the remarks by Kanarfogel (above, n. 131) on the relationship of the *yeshivot* to the communities.

[164] It would appear that the absence of centralisation of text production and the lack of critical supervision of the text versions and their dissemination persisted during the print era in what concerned works that never saw print, especially works of Kabbala or Hasidism. An exception was the private copying enterprise initiated and managed by Moshe Zacuto for the purpose of distributing uniform and supervised copies of the writings of Rabbi Yitsḥaq Luria, as recorded by Ḥayyim Vital, and for the purpose of disseminating his own writings, as Yosef Avivi exposed in his article 'Solet neqiya – nafato shel Rabbi Moshe Zakut', *Pe'amim*, 96 (1993), pp. 96-106 (in Hebrew): 'He would propose to his students the texts to be copied for them, he would select the suitable scribes and oversee their work, supervise the quality of the copying, transmit the payments, and send the manuscripts to their destinations' (ibid., p. 97 [trans. I.G.]).

[165] Menahem Haran has commented that in earlier periods the canonisation of the Bible (and of the Oral Law) resulted in the absence of libraries in Jewish communities. According to him, libraries, mostly private ones, began to appear only in the Geonic period when manuscripts of parts of the Bible and its translations, of parts of the Mishna and Talmud, as well as of halakhic literature in its formation stages - began to abound. See his article 'On Archives, Libraries and the Order of the Biblical Books', in *The Bible in the Light of its Interpreters: Sarah Kamin Memorial Volume*, ed. S. Japhet, Jerusalem, 1994, p. 229-234 (in Hebrew).

[166] For literary evidence indicating that the private libraries of dignitaries in Castile and Aragon in the later-13th and early-14th century, and even more manifestly among Sefardic Jews in Salonika during the 16th and 17th century served as public libraries for the use of scholars and their disciples, see J. Hacker, Public Libraries (above, n. 156). The literary evidence presented by Joseph Hacker according to which these 'midrashim' were also venues for the copying of books for private libraries open to the public, initiated and financed by those dignitaries, or indeed scriptoria of sorts, still require validation by

A number of European sources relating to book production cited at the beginning of this section provide some information about the fees of hired scribes and their work procedures. We found such testimonies about the hiring of contractors, contracting fees calculated per quire in late fourteenth century Crete,[167] global annual fees (including a subsistence allowance), and weekly work hours in northern Italy in the early sixteenth century.[168] More information about scribes' fees in the Islamic lands may be found in Geniza letters, and especially in the studies by Goitein and Gil noted above. A letter written between 1020 and 1050 by Shlomo ben Yosef HaCohen of Dalton in the Galilee, who copied books for Rabbi Hillel of Tiberias, is particularly instructive. It suggests that the calculation of the scribe's pay was based not only on the number of quires, but also on the number of characters, just like in modern times.[169] A document cited by Goitein indicates the daily fee of a scribe who, in the first half of the eleventh century, copied a codex containing Prophets under the supervision of his employer – presumably in the impressive format in which Biblical codices were copied at that time

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evidence from the actual extant manuscripts from those regions and those periods. One would expect that such a reality would leave some traces in the thousands of extant colophons inscribed before 1540 and documented in the Hebrew Palaeography Project, and it is unlikely that scribes hired by dignitaries not mention this fact explicitly in the colophons of the copies they produced. The only dignitary mentioned by Hacker, about whom two colophons testify that two manuscripts had been copied for him – one in Salonika in 1509 and the other in 1516 – is Shemu'el ben Meir ben Ban Benest, see ibid., p. 273, n. 46.

[167] That the fee for a scribe's work in Candia (Crete) was calculated per quire can be learned from a letter written in Damietta at the end the 15th century by Elia ben Elyaqim of Chania to Moshe ben Yehuda in Alexandria (MS Oxford MS. Heb. C. 72, fol. 14): וכן תמצא איך נתפשרתי עם הסופר ב׳ מרצלוש בקונטרס ויתרון על כל הספר מרצלוס >... ואני> חושב שיעלה יותר מי״ז קונטרסים. ובעת נסיעתי מקנדיאה חשבתי שיעלה יותר מי״ז קונטרסים, <ועתה> הספר בידיך ותמדוד אותם כמה הם ותעשה החשבון כבודך כמה הם עולים בחשבון י״ב מרצלוש <בד>וקט ונצ\"יין. ועל הספר יוסף בן גוריון נראה לי, אם אני זוכר בטוב, נתפשרתי בדוקטי ב׳ או ב׳ וח<צי>. The letter mentions the rate of two marcellos (a silver coin minted in 1472) per quire. See M. Benayahu, 'Book trade between Candia and Egypt', in *Yad le-Heiman: A.M. Habermann Memorial Volume*, ed. Z. Malachi, Lod 1983, p. 264 (in Hebrew). The Oriental book-lists from the Geniza also provide evidence that the cost of copied books was sometimes calculated by the quire (see e.g. Allony, *Jewish Library*, no. 76).

[168] For the yearly wages (37 פרחים) of the scribe Perets, who was hired to copy all the Talmud tractates, see above n. 133; Assaf (*Mekorot*, vol. 2, p. 110) observed that this was equal to the teaching wages of Rabbi Yisra'el Isserlein! According to that source, the scribe was expected to put in 44 weekly work hours.

[169] MS Oxford MS. Heb. c. 13, fol 14. (Neubauer & Cowley Catalogue 2807/14) was published by S. Assaf, 'Le-toledot ha-yishuv hayehudi be-erets yisra'el', in his book *Texts and Studies in Jewish History*, Jerusalem 1946, pp. 38-42. See also Gil, *History of Palestine*, vol. 1, p. 193. For the cost of copying per quire, see N. Allony, 'Ha-sefer u-melekhet ha-sefer be-erets yisra'el bi-yemei ha-beinayim', *Shalem*, 4 (1984), pp. 15-16.

– had been around one dirham per day, and, according to Goitein, this wage was equivalent to half the wages of an untrained laborer![170] This evidence regarding the pittance earned by scribes in the Middle East reflects their inferior socio-economic status, AND echoes paralleling the inferior social and intellectual status of the scribe according to *Sefer Ḥasidim*, which advises to assign the task of manuscript copying to those unsuited even for studying *aggadah* (homiletic literature) and the Bible.[171]

In contrast to the meagre information about scribes' fees, the abundant sources concerning prices of medieval manuscripts are worth mentioning. Two major European sources of evidence, most of which derive from Italy, are available to us. A wealth of information can be gleaned from deeds and records of sales of manuscripts, inscribed on the blank pages, generally at the end of the sold manuscript. Zunz, Steinschneider, and Berliner already presented data, culled from a selection of deeds of sale and notes of purchase,[172] regarding the prices of manuscripts bought from their owners; these data have not yet been methodically assembled and are still awaiting a systematic analysis of the comparative value of the sums indicated according to their respective times and regions. Indications of manuscripts' value in lists of books to be divided among heirs would be another plentiful source: the estimated value of each item would be inscribed in them so as to ensure their equitable division.[173] More comprehensive

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[170] MS Cambridge T-S Or. 1080 J200; See Goitein, *Mediterranean Society*, vol. 2, p. 238 (information on the daily wages of unskilled workers is provided by Goitein, ibid., vol. 1, p. 99). Indeed, Goitein wondered why in a society that consumed books, the scribal craft, which required both knowledge and skill, should be rewarded with such poor wages (ibid., vol. 2, p. 237). Although those who commissioned the books provided the writing material, there was a striking discrepancy between the cost of producing books and their commercial value, as reflected in Geniza documents. One document details the wages of the scribe Zakai ben Moshe, active during mid-12th century (see N. Allony, 'Four Book-Lists from the Twelfth Century', *Qirjath Sepher*, 43 [1968], p. 125), for copying an Arabic translation of the Pentateuch on parchment: three dinars, half a dinar received as an advance, and after completion of a third of the copy the scribe cut the price by half a dinar, see Goitein, ibid., According to a deed from 1021, cited by Goitein (ibid., p. 239), the scribe received 25 dinars for the copying of Prophets and Hagiographa. Goitein notes that a similar pay for the copying of a Hebrew Bible is mentioned in a letter to Nahary ben Nissim. For prices of copying (and prices of books) according to Geniza documents, see also Allony, 'Ha-sefer u-melekhet ha-sefer' (above, n. 169), pp. 15-18. A number of colophons inform us of hired scribes' complaints, their poverty and hard work conditions (see below in chapter 13, in the section entitled 'Private production and its impact on the transmission: hired scribes and owner-copyists).

[171] Above, n. 124.

[172] Zunz, *Zur Geschichte*, pp. 211-213; Steinschneider, *Vorlesungen*, pp. 40-41; Berliner, 'Ein Gang', pp. 100-102. Nurit Pasternak conducted a comparison between the fees of Christian scribes and the prices of used Latin books and the fees of Hebrew scribes and the prices of Hebrew books in 15th- century Florence *(Together and Apart*, chapter 3, section 4).

[173] An illuminating example is found in the above mentioned list of books that were divided among 7 sons (n. 118); yet, appraisals are usually inscribed as <...> נערך, in an annotation apart at the beginning

data are contained in the commercial documents among the many book-lists in the Geniza, which, as mentioned, frequently include the prices of books as well as the price of the copying.

6. The indispensability of the comparative perspective for Hebrew codicology

How remarkable it is to witness the extent to which the practices of book production are imprinted by a shared tradition in all the cultures in which the codex served as a receptacle for texts, and as a means for their preservation and dissemination, regardless of acutely different languages and scripts! One may marvel at the force of the regularity and continuity revealed in the basic structures, in production techniques, the social and intellectual function, and the aesthetic principles embodied in the mid- and late medieval codices in all those book civilisations. Whether these codices be inscribed in Latin, Greek, Arabic and Persian or Hebrew scripts spread over vast territories and in sundry regions, or inscribed in the Syriac, Coptic, Glagolitic or Cyrillic scripts – all equally partake of the very same anatomy of the codex, common writing materials, similar proportions and formats, and the analogous molecular structure of quiring achieved by the folding and stitching together of a regular number of bifolia, as well as of the use of a variety of means of notation in the margin to ensure the correct order of the quires and bifolia. The great majority of these codices would be prepared for copying by laying out the design of the writing surface, proportionately to the entire surface of the page, and by the use of ruling in a variety of techniques - most of which were nonetheless shared - to serve as scaffolding for the writing. All made use of additional para-scriptural and peri-textual means for improving the readability of the copied text and for making its structure transparent, and some would included decorations, ornamentation and illuminations in the margins or in the body of the copied text. Although the embodiments of this common infrastructure underwent changes over time, as for example in the composition of the quires, the ruling techniques, and the text's disposition on the page, this structure has also displayed, throughout its permutations, a stability and continuity lasting close to a millennium, allowing us to view it as some kind of universal grammar that permeated, in some elusive ways, all codex civilisations. Furthermore, its imprint can still be recognised even after the

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of the manuscripts. The appraisal of the books value by a scholar is already mentioned in the German *Sefer Ḥasidim*, circa 1200: החכם היה עורך ושם ספרים ומה שוים ובכמה לתתנם ושאל לו תלמידו >דבר תורה, ולא ענהו ...> אמר לו : עתה אני צריך יישוב הדעת שאני עוסק לשום ספרים (passage 826).

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invention of the mechanical printing press, which, notwithstanding its revolutionary nature, still embodies patterns inherited from the deep structure of the manually produced codex. In truth, the codex formation has survived very much into our own times, despite the paradoxical resurrection of the form of the vertical scroll –the rotulus – on computer displays.

The existence of a common basic tradition of codex production warrants, therefore, that we integrate a comparative perspective and rely on it in our research and in detemining the codicological typology of each of the script cultures,[174] calling even for the establishment of a general comparative codicology. All the more crucial is the reliance on a comparative perspective in the study of Hebrew manuscripts and in establishing their historical typology.[175] This need is an outcome of the wide dispersal of Hebrew manuscript production in the zones of the codex civilisations in the Mediterranean perimeter and in adjacent regions to its north and east. No doubt, this dispersal and concomitant distribution of script types of the Hebrew codex render the comparisons between Hebrew bookcraft and design and those of the host societies of vital importance for the understanding of the unique typology of the Hebrew book in each of its different diasporas, and for the identification of its sources of inspiration and affinities. Indeed, despite the shared script and, in most copied and designed books, the shared use of the Hebrew alphabet, and despite the strong religious cohesion and social solidarity, the affinity of Hebrew codices with one another is often lesser than that which existed with non-Hebrew codices produced by host societies. This said, the degree of affinity between Hebrew bookcraft and script styles to those of the non-Hebrew codices was not the same in all regions or civilisations, and it can attest to the nature of the relationship with the dominant alien society. It thus clearly appears that the practices of Hebrew book-making in the Near East were greatly influenced by the book culture of the Muslim host society, and that the manuscripts produced in Muslim

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[174] See M. Beit-Arié, 'Why Comparative Codicology?', *Gazette du livre médiéval*, 23 (1993), pp. 1–5.

[175] The indispensability of the comparative approach and the rewards of implementing it were first emphasised in my book *Hebrew Codicology*; this emphasis is reflected also in the subtitle of my book *Hebrew Manuscripts of East and West: Towards a Comparative Codicology*, see ibid., pp. 99-103. There I remarked that Hebrew manuscripts, by bridging between East and West and between Islam and Christianity, may serve as a productive medium for comparative research. Indeed, in recent years awareness of the importance of the comparative aspects of bookcraft has been spreading within European codicology as well. This is evident in the collection published in 1998, Hoffmann (ed.), *Codicologie comparée*, which brought together articles presenting data on the material characteristics of Latin, Greek, Arabic, Persian, Hebrew, Syriac, and Armenian manuscripts.

Spain (and after the Christian *reconquista* also in Christain Spain) and in North Africa were much affected by Arabic calligraphy but less so by Arabic book-making; on the other hand, the codicological features, design and scripts of Hebrew manuscripts produced in France and Germany were definitely marked by Latin manuscripts produced in their respective environments, yet this was less so in Hebrew manuscripts produced in Italy until the fifteenth century.[176] Employing a comparative perspective in these regards may enable us not only to deepen our understanding of transformations in the practices of bookmaking in the various zones, but also help elucidate an issue much debated by historians, who diverge in their assessments as to the degree to of acculturation and integration of the environment's ways and customs by the Jewish society, or the degree of reclusion of these persecuted and rejected minorities, which were yet embedded within gentile societies.[177] This comparative narrative can also guide us in reaching conclusions regarding the extent to which the majority culture seeped into the minority culture in its domains.

Consequently, the historical typology presented in this book will include comparisons between the many codicological features and characteristics displayed by the Hebrew manuscripts and those found in Latin, Greek, and Arabic scripts, and sometimes also in other scripts, such as the Syriac or Coptic, on the basis of published research.

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[176] See Beit-Arié, East and West, chapter 2; M. Beit-Arié, 'Towards a Comparative Typology of Italian Hebrew and Latin Codices', in *Libri, documenti, epigrafi medievali: Possibilità di studi comparativi – Atti del Convegno internazionale di studio dell'Associazione Italiana dei Paleografi e Diplomatisti, Bari (2–5 ottobre 2000)*, ed. F. Magistrale, C. Drago & P. Fioretti, Spoleto 2002, pp. 377–396.

[177] Specifically in regard to the production of Hebrew manuscripts in Italy during the Renaissance, especially in Florence, Nurit Pasternak well demonstrated the possibility of extracting from the study of bookcraft practices information regarding the degree of integration of Jews within Christian society, or conversely, of their insularity (*Together and Apart*, esp. the introductory chapter). Pasternak emphasised the dialectical dynamics involved in the very production of Hebrew manuscripts within a gentile society and which cannot take place in a secluded environment that is not exposed to contrasts and is not forced to cope with them. This dynamics, she argues, can be perceived as fertilising, or can be interpreted as the assimilation of foreign practices. Alongside characterisations such as 'symbiosis' or 'osmosis', used to assess the affinity of the Jewish minority society with Christian society, she proposes adopting the term 'adsorption' – a term in chemistry describing a state in which the adsorbing body does not change its essence or nature. See also M. Beit-Arié, 'External and Internal Frontiers in Hebrew Manuscript Production', in *Proceedings of the Third European Congress of Medieval Studies (Jyväskylä, 10–14 June 2003)*, ed. O. Merisalo, Louvain-La-Neuve 2006, pp. 399–407.

Chapter 2: Colophon Components and Scribal Formulas

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אני ישראל בר׳ שמואל דנרבונה יצ״ו כתבתי זה
המורה לעצמי וסיימתיו בחדש אלול בשנת מאה
ושלש לפרט המקום יזכני להגות בו זרעי וזרע זרעי
עד סוף כל הדורות ויקיים בי מקרא שכתוב לא
ימוש ספר התורה הזה מפיך והגית בו יומם ולילה
ואז תצליח את דרכיך ואז תשכיל הלא צויתיך חזק
ואמץ. והודעתם לבניך ולבני בניך אמן אמן סלה

Colophon of Maimonides' *Guide to the Perplexed*
user-produced by Yisra'el ben Shemu'el of Narbonne, Provence, 1343
MS Tübingen, UB Ma IV 2, fol. 207v

As against the scarce documentary and literary sources on book production and consumption, abundant data can be found within the manuscripts themselves. Alongside the various aspects of bookcraft, of the culture of writing and of design traditions which they embody these authentic documents relate the information provided by the copyist on the circumstances of production. In fact, valuable material is disclosed in manuscripts' colophons,[1] which were the only verbal part composed by the scribe. They serve, therefore, as chief sources of information about the realities of book production and consumption and the surrounding social circumstances, in the

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[1] See M. Riegler, Colophons of medieval Hebrew manuscripts as historical sources, [Jerusalem] 1995 (Dissertation, the Hebrew University [in Hebrew]). In the context of historical sources one should further note how rare it is to find in illuminated Hebrew manuscripts illustrations of scribes engaged in copying, which could furnish invaluable information concerning scribal tools and modes of copying. Latin manuscripts, by way of contrast, abound with such illustrations, and although most of them depict the scribes of the gospels, they nevertheless reflect contemporaneous practices of writing. For a handsome collection of articles devoted to such illustrations in Latin manuscripts, see below, chapter 11, n. 3. On the few representations of scribes in Hebrew manuscripts – most of them created by Christian artists – see T. Metzger, 'La représentation du copiste dans les manuscrits hébreux médiévaux', *Journal des savants*, janvier–mars (1976), pp. 5–32.

same way that colophoned and dated manuscripts serve as a basis for uncovering codicological typologies and their transformations.[2]

The term 'colophon' is a loanword from the Greek κολοφών, meaning climax or summit. In the context of bookcraft it is an inscription written at the end of a copy, or at the end of one of the texts contained in the codex,[3] where the scribe provides information about the production of the copy. Many Hebrew manuscripts are uncolophoned. Since the colophon is usually inscribed at the end of the manuscript, and since the first and last folios of a manuscript are generally more vulnerable to damage over time, a certain number of colophons would be lost in this manner. However, many manuscripts have survived in their entirety, or at least the page on which the colophon would have been inscribed did survive, and yet no colophon is present. Hence it stands to reason that complete manuscripts were copied uncolophoned by literate individuals for their personal use, and that they saw no reason to inscribe a colophon at the end.[4] This said, one should emphasise that indeed, a considerable portion of the extant

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2 Ezio Ornato attempted to investigate a possible correlation between the proportion of colophoned Latin manuscripts and their time of production, or their writing material etc., and went on to suggest a number of hypotheses in this regard. See E. Ornato, 'Libri e colofoni: Qualche considerazione', Gazette du livre médiéval, 42 (2003), pp. 24–35. The notion has also been advanced that colophoned manuscripts reflect particular circumstances of production, and, accordingly, should not be used to characterize manuscripts as a whole. See the review of A.J. Piper, 'Catalogue of Dated & Datable Manuscripts c. 700–1600 in the Department of Manuscripts in the British Library by Andrew G. Watson, The British Library, 1979', Medium Aevum, 50 (1981), p. 105. This view may be somewhat justified in regard to Latin manuscripts, but is not valid in the reality of the individual production of Hebrew books. In what concerns the presence of colophons, there is no difference between manuscripts copied by hired copyists and those copied by users/patrons..

3 In some manuscripts copyists would take care to inscribe a colophon at the end of each independent text or of each disparate opus. See e.g. MS Paris Hébreu 10 (Manuscrits médiévaux I, 108), inscribed in Tlemçen in 1455 (its last text was copied in 1456), containing eight colophons.

4 It should be mentioned that the Ashkenazic Pietists circles apparently refrained from writing colophons, as implied by Sefer Ḥasidim, which condemned some scribal practices common in Germany, that were contrary to the virtue of personal humility preached by this movement at the turn of the 12th and 13th century: 'And when a person completes the twenty-four books <i.e. the Bible>, while one or two pages remain in the quire, he should not note on those pages: I have completed <this> on such and such a date, nor anything else that was not strictly necessary. And should he wish to write, let him take a leaf and paste it to the board <of the binding> or attach it to the board, but the quire should not be used for writing' (Sefer Ḥasidim, passage 600 = Sefer Ḥasidim MS Parma, p. 135). And cf. passage 707, which is identical to passage 1750: 'One scribe completed the copying <of a manuscript> for an elderly man and wished to write: I, so and so, copied this book for such and such. The patron who hired him said to him: I do not wish you to write my name in the book you copied for me. He asked: Why? <The patron> replied: Because some people inscribed it so, but it did not remain in their hands nor in their children's hands, because it was sold.' This anecdote refers to indications of ownership in the colophon and the traditional blessing formulas accompanying them, and not to the writing of a colophon. See Beit-Arié, 'Ideals Versus Reality', pp. 561-562.

colophoned manuscripts were owner- or user-produced. The four thousand extant colophons[5] in medieval codices inscribed in Hebrew script constitute a significant proportion – about seven percent – of the estimated sixty thousand complete or partial codicological units; in other words, of the total estimated number of all extant codicological units, excluding the fragmented remains that survived in the Oriental *genizas* or those used secondarily as bindings in European libraries and archives. It appears that the number of explicitly dated colophons that survived in Hebrew script (around three thousand and seven hundred) is relatively larger than of those surviving in Latin script.[6] In addition, Hebrew copyists supplied in their colophons more information about the making of the book and those (sometimes women) involved in its production and use, and tended to elaborate on these at length. This abundant information may somewhat compensate for the absence of early codices in regions outside the Middle East, and their reduced numbers prior to the thirteenth century, both of which are limiting factors in Hebrew codicology research.

A typical elaborate colophon would include the following components:

    a.   name of the scribe;

    b.   name of the individual, or patron, who commissioned the copying, or an indication that the scribe copied for his own use;

    c.   title of the copied text or texts;

    d.   date of the copying completion;

    e.   locality of the copying;

    f.   eulogies, blessings and good wishes for the person who commissioned the copying.

Sometimes scribes would include valuable information on the circumstances and background of the copying, on the copy they had, on their critical approach to the text and its transmission, the duration of copying, remuneration, and other personal and historical data.

Not all colophons contain all these components and their order may vary. Some of them would, of course, be quite brief and include only one component, such as a date or the name of the scribe, while other colophons would be much lengthier.

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5 For the number of extant colophons, see above chapter 1, n. 137.

6 As mentioned, the Syriac manuscripts display the greatest wealth of dated colophons, which, apparently, are also quite detailed (see above, chapter 1, n. 51).

The earliest Hebrew scribe's colophon (as opposed to an author's or editor's colophon), which - although undated - had been identified as originating in as early as the fourth century, appears on a magical papyrus inscribed in late Western Aramaic, unearthed in Oxyrhynchus, Egypt.[7] It contains the scribe's name, and an ending formula.

אנה שאול ב[ר ̊] לעזר כתבת אלין כתנ[..]] שלום על ישראל אמן ואמן סלה

A colophon whose author included all the main components appears at the end of a manuscript containing the entire Bible, copied in Burgos, Spain in 1207[8] for the father of Rabbi Yosef ben Todros ben Meir HaLevi <Abulafia>:
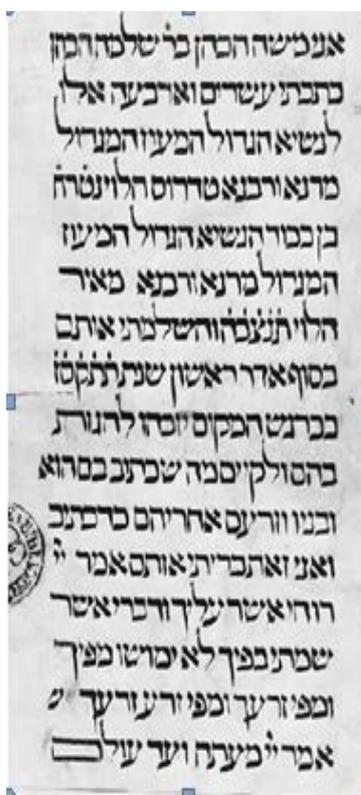
אני משה הכהן בר׳ שלמה הכהן כתבתי עשרים וארבעה
אלו לנשיא הגדול המעוז המגדול מרנא ורבנא טדרוס
הלוי נט׳<ריה> רח׳<מנא> בן כבוד הנשיא הגדול המעוז
המגדול מרנא ורבנא מאיר הלוי תנצב״ה והשלמתי
אותם בסוף אדר ראשון שנת תתקס״ז בברגש המקום
יזכהו להגות בהם ולקיים מה שכתוב בם הוא ובניו
וזרעם אחריהם כדכתיב <ישי׳ נט:כא> ואני זאת בריתי
אותם אמר ה׳ רוחי אשר עליך ודברי אשר שמתי בפיך
לא ימושו מפיך ומפי זרעך ומפי זרע זרעך אמר ה׳ מעתה
ועד עולם (fol. 389v)

Unlike the said Spanish manuscript, which included all the colophon components, the scribe of a roughly coeval biblical manuscript copied nearby indicated the location (Toledo) and the date of completion (1197), only briefly, without any embellishments of formulas or wishes and with no indication of his own name or the copy's destination. Was he copying for his own use or was he

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7 MS London Or. 9180C (See Sirat, *Papyrus*, pp. 115-116 and the literature cited there, as well as plate 55 [=Birnbaum, Hebrew Scripts, no. 152, where the same plate is clearer]). At the end of Tractate Ta'anit in the Fusṭāṭ Geniza palimpsest of a Palestinian Talmud inscribed over Greek, MS Cambridge T–S 12.187 (facsimile edition: C. Taylor, Hebrew-Greek Cairo Genizah Palimpsests from the Taylor-Schechter Collection, Cambridge 1900, pl. IV) – remnants of a codex copied undoubtedly before the 9th century – a concluding formula for the tractate was inscribed in smaller characters, justified to the centre, the beginning of which is typical to a colophon: חזק הכותב זכי<נו> להש[ל]ים בשלום נזכה ללמד בשלום. This text was published without a bibliographical reference by L. Ginsberg, Yerushalmi Fragments from the Genizah, New York 1909, p. 185 (in Hebrew) and on this basis was cited by J.N. Epstein Mavo' le-nusaḥ haMishna2, Jerusalem-Tel Aviv 1964, p. 935; see also. Y. Sussman, 'Additional notes to "A Halakhic Inscription from the Beth-Shean Valley"' Tarbiz 44 (1974-75), p. 194 (in Hebrew).
8 MS Paris Hébreu 82 (See Manuscrits médiévaux I, 1)

hired by an unmentioned patron? The colophon reads: נשלם בירח טבת שנת דתתקנ״ח

במתא טליטלה[9]. A laconic colophon including only a date is found in a fragment of a manuscript of *piyyutim* (liturgical poems), copied in the Middle East in 1079: נשלמה

בחדש תמוז בשנת אש״ץ (completed in the month of Tammuz in the year 1390 <of the Seleucid era> [1079]).[10]

A magnificent example of a long and informative colophon is the one inscribed at the
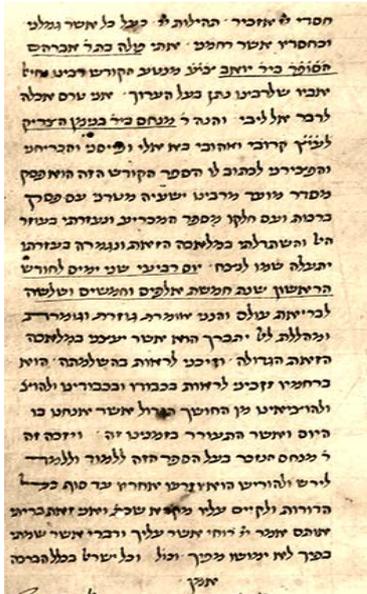
end of an impressive two-volumed halakhic manuscript, copied in 1293 by Paula *bat* <daughter of> Avraham the Scribe, most probably in Rome[11]:

חסדי ה׳ אזכיר, תהילות ה׳, כעל כל אשר גמלני,
ובחסדיו אשר רחמני, אתי פולה בת ר׳ אברהם הסופר

9 MS Paris 105 Hébreu 105 (See Codices hebraicis médiévaux, Part IV, Manuscrits . 95)

10 MS Oxford MS. Heb. d.66, fol. 120 (See Codices hebraicis, Part II, Manuscrits 39). On the Seleucid Era, see below, section 3.

11 MS Oxford MSS. Can. Or. 88–89 (Neubauer Catalogue, 634-635). Paula copied Pisqei HaRID (legal rulings of Rabbi Isaiah di Trani) on several Talmudic tractates following the request of a relative of hers.This remarkably skilled scribe copied another three manuscripts in calligraphic script: five years earlier in 1288, in Rome, she copied for her own use a two-volumed manuscript of commentaries to the Prophets, which prior to World War II had been kept in Breslau as MS Jewish Theological Seminary 104 (Loewinger & Weinryb Catalogue 27-28). The manuscripts, like all the Seminary collection, had been confiscated by the Nazis and disappeared until they were re-discovered much later in northern Moravia (apparently in Miemes castle) together with another 33 manuscripts of that library and were stored in the National Library in Prague. In 2004 they had been transferred to the Jewish community of Wrocław (Breslau) and deposited in the University library. In the Breslau-Prague-Wrocław manuscript, Paula added her husband's name, Yeḥi'el ben Shelomo, to her own and, as in the other colophons, her ancestry as well: מנטע הקודש רבינו יחיאל אביו שלרבינו נתן בעל הערוך ('scion of the holy Rabbi Jeḥiel the father of Rabbi Natan author of He'Arukh' [as cited in the said colophon]). It follows that she was descended from one of the brothers of the famous author of the first Talmudic dictionary. The traces of another manuscript, a prayer-book copied in 1306, have been lost, but we know of its existence in the library of the Jewish community of Verona. The text of its colophon appeared in a book review by Avraham Berliner: <A.> Berliner in Magazin für die Wissenschaft des Judentums, 11 (1884), p. 142. The manuscript was copied for Shelomo ben Shelomo, of blessed memory, son of Moshe ben Yekuthi'el - undoubtedly her son from her second husband and named after his father, who had probably passed away before his son was born. A fourth manuscript in Paula's hand, MS Moscow, RSL, Guenzburg Collection

ביר׳ יואב צי״ע[12] מנטע הקודש רבינו יחיאל אביו שלרבינו נתן בעל הערוך. אני טרם אכלה
לדבר אל ליבי, והנה ר׳ מנחם ביר׳ בנימן הצדיק לעי״ץ[13] קרובי ואהובי בא אלי ופייסני
והכריחני והפצירני לכתוב לו הספר הקודש הזה הוא פסק מסדר מועד מרבינו ישעיה מטרני
עם פסק ברכות ועם חלקו מספר המכריע ונעזרתי בעוזר האל והשתדלתי במלאכה הזאת
ונגמרה בעוזרתו יתעלה שמו לנצח, יום רביעי שני ימים לחודש הראשון שנת חמשת אלפים
וחמשים ושלשה לבריאת עולם והני אומרת גוזרת וגומרת ומהללת לאל יתברך הוא אשר
יעצני במלאכה הזאת הגדולה, וזיכני לראות בהשלמתה, הוא ברחמיו יזכיני לראות בכבודו
ובכבודינו ולהוציאנו מן החושך הגדול אשר אנחנו בו היום ואשר התעורר בזמנינו זה. ויזכה
זה ר׳ מנחם הנזכר בעל הספר הזה ללמוד וללמד לירש ולהוריש הוא וזרעו אחריו עד סוף
כל הדורות ולקיים עליו מקרא שכתי׳ <יש׳ נט:כא> ואני זאת בריתי אותם אמר ה׳ רוחי
אשר עליך ודברי אשר שמתי בפיך לא ימושו מפיך, וכול׳<יה> וכל ישראל בכלל הברכה אמן

(MS Oxford MS. Can. Or. 89, fol. 257r)

Colophoned manuscripts are vitally important for the formation of a codicological typology since they constitute a representative substructure which, in most cases, is anchored in the date of production, and in half of the cases also in the area of production, thus furnishing a base for the characterisation of bookcraft types and, moreover, for the identification of the many uncolophoned manuscripts. In addition and as noted, the colophons themselves are reliable historical documents which serve as primary sources for our restricted knowledge of the material realities of production, distribution, and consumption of Hebrew books, on the modes of textual transmission, and on the identity and status of scribes and patrons. Indications of locality are of great historical value for despite the accidental survival of colophons, their numbers may suggest the size of a Jewish community in a certain locality, and especially its intellectual character. It goes without saying that the dozens of colophons indicating a locality where a Jewish community had not been evidenced in any other contemporaneous historical source are historical documents of great importance.

1. Manuscript producers – their names and labour division among them

The name of the scribe is specified in an overwhelming majority (almost 80%) of the colophons of dated manuscripts. This figure excludes colophons in manuscripts whose copyists have been identified through other means or whose names are alluded to but

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618, contains no colophon but should surely be identified as hers. This is attested both by the characteristic script, and by the codicological traits related to the production of the codex. Indeed, the characters of Paula's name are highlighted as in an acrostic a number of times in this manuscript (on this scribal custom see below, at the beginning of the appendix to section 1 of this chapter). MS Moscow contains the text of Pisqei haRID on several Talmudic tractates, and is therefore an additional part of the copying of Pisqei haRid, which were copied in the two monumental Oxford volumes.

12 For the reading of this acronym, see below, n. 64.

13 For the reading of this acronym, see below, n. 63.

not explicitly recorded; however, it includes the few colophons which were not inscribed by copyists but by other collaborators in the production (usually vocalizers or Masoretes). A similar proportion of explicit scribal names can be found among the colophons of all Hebrew manuscripts, whether dated or undated, whether documented or not. Since a considerable portion of manuscripts was copied by their owners for personal use, it is no wonder that the proportion of colophons in which the names of the patrons were mentioned is no greater than 37% in both dated and undated documented manuscripts. Sometimes names of others involved in the production would be mentioned in the colophons of biblical texts: these include the Masorete (מסרן) – who copied the Masora magna in the upper and lower margins of the text and the Masora parva in the spaces between the columns of the biblical text, and the vocalizer (נקדן), who added the vowels and cantillation marks to the text, and who, in the case of biblical manuscripts, would also be the Masorete. In a few biblical copies the scribe noted that he himself had both vocalized the text and annotated the Masora, from which

we may conclude that he was a professional copyist, well-versed in the production of biblical codices. As, for instance, the scribe of Maghrebi origin who wrote at the end of a manuscript of Prophets which he completed in 988/9 in Jerusalem: I Yosef ben Yaʿaqov the Maghrebi <…> wrote, vocalized, and copied the Masora' (אני יוסף בן יעקב המערבי >...> כתבתי ונקדתי ומסרתי).[14]

Shemuʿel ben Yaʿaqov (the scribe of the famous manuscript known as 'MS Leningrad', that was copied in 1008 in Cairo and is the earliest dated codex that preserves all the books of the Hebrew Bible in their entirety) copied, vocalized, and inscribed the Masora annotations, as he detailed in one of the many colophons of this manuscript, fol. 474r: אני שמואל בן יעקב כתבתי ונקדתי ומס׳<רתי> זה המצחף לכבוד רבנא מבורך הכהן בן יוסף הידוע בן אזדאד[15] The lack of labour division in the copying of a biblical text and whatever

14 MS St. Petersburg Евр. II B 39 (See Codices hebraicis, Part I, Manuscrit 12)

15 MS St. Petersburg Евр. I B 19a (See Codices hebraicis, Part I, Manuscrit 17), and ibid. the brief descriptions of three other manuscripts in which colophons Shemuʿel also wrote: 'I copied, vocalized, and inscribed the Masora').

accompanies it and the specialisation in the copying of biblical codices, including all layers of the biblical text, is a prominent feature of early biblical manuscripts produced in the Middle East, but occurs in Ashkenaz as well.[16] An example of a colophon by a scribe-vocalizer-Masorete in the Ashkenazic zone is MS Berlin Ms. Or. 4° 9, produced by Eliyahu ben Berakhia in רדום (Rouen[17], France) in 1233: אני הסופר והנקדן אליהו בן <…> ברכיה הנקדן <…> כתבתי ונקדתי ומסרתי (I, the scribe and vocalizer Elijah ben <…> Berakhia the vocalizer <…> copied, vocalized, and inscribed the Masora). This phenomenon decreases toward the end of the thirteenth century and one can discern a tendency to separate the production roles. Both in Spain and in Italy scribes would sometimes fulfill the function of vocalizer-Masorete as well.

Vocalizers, Masoretes, illustrators, editors, and binders

In many biblical manuscripts, production was divided between the copyist and a fellow-scribe who added to the text the accompanying layers which required expertise beyond calligraphic skill. In more than a few cases, the Masorete-vocalizer would add a colophon of his own to that of the copyist, as in one of the earliest manuscripts copied by the scribe of the famous Aleppo Codex (which colophon did not survive), MS St. Petersburg Евр. II B 17, a Pentateuch completed in 929 and ending with a colophon by the scribe Shelomo ben Buya'a HaLevi; after two pages the scribe's brother added the colophon (containing only a date): אני אפרים בן רבי בויאעא נקדתי ומיסרתי וכללתי את התורה הזאת ובדקתי אותה.[18]

Another example of double colophons can be seen in MS Oxford MS. Can. Or. 91, copied in Germany. At the end of the manuscript (fol. 307r) the scribe inscribed the colophon in square script, and noted that he completed his copy on the 4th day of Ab, 1304:

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16 In half of the 16 extant dated manuscripts produced prior to 1028 the scribe both vocalized the text and inscribed the Masora.

17 On this identification of רדום see N. Golb, Les Juifs de Rouen au Moyen Age: portrait d'une culture oubliée, Rouen 1985, pp. 39-52. See also Toledot hayehudim ba-'ir Rouen biyemei habeinayim, Tel Aviv 1976, pp. 23-31 [in Hebrew].

18 See Codices hebraicis, Part I, Manuscrit 5. According to the colophon of the vocalizer-Masorete, he also proofread the Pentateuch. Furthermore, it stands to reason that by using the term וכללתי he tried to indicate that he had also decorated and beautified the manuscript (see ibid., p. 53). Indeed, the Masora and related matters were sometimes inscribed in decorative patterns and the tallies of the numbers of verses are accompanied by miniature ornamentations. For the decoration of manuscripts by vocalizers-Masoretes, see below, n. 23, and in the passage the note refers to.

בר׳ אליעזר [19]אני יהודה בר׳ מנחם הסופר סיימתי זה התרגום וחמש מגילות והפטרות לר׳ {גרשום}
ביום ג׳ פרשת דברים ארבע ימים בתוך ירח אב שנת חמשת אלפים וששים וארבע לבריאת עולם
המקום יזכהו להוריש אותו לבניו ולבני בניו עד סוף כל הדורות אמן אמן אמן סלה

The vocalizer-Masorete, who copied the Masora in tiny characters in the form of geometrical ornamentation in the manuscripts' openings, took about a year to complete his toil. At the end of the Masora, beneath the scribal colophon, which he decorated, the vocalizer-Masorete added his own colophon, the beginning of which is in rhymed verses:

ברוך העוזר אשר עזרנו עד הנה, ויעזרני
לתקן לי לעצמי כהנה וכהנה ויתן לי
רחמים וחמלה, וחנינה וסגלה, ולחם
ושמלה, וכבוד ועשר, ותם לבב ויושר,

וארך ימים בחושר, אני אליעזר בר׳ ישעיה הנקדן נקדתי ומסרתי זה התרגום וחמש מגלות
והאפטרות למורי [חסיד] ר׳ גרשם בר׳ אליעזר וסיימתי אותו ביום ו׳ פרשת בהעלותך את
הנרות שמנה עשר ימים לירח סיון שנת חמשת אלפים וששים וחמשה לבריאת עולם המקום
יזכהו להוריש לבניו ולבני בניו עד סוף כל הדורות אמן אמן סלה ויהיה לו ברכה וגדולה
ושמחה וגילה וצהלה

In a number of manuscripts we find a colophon by the Masorete-vocalizer, and in biblical codices that lack the Masoretic annotation, only that of the vocalizer; it is unknown whether the Masora or vocalization were added directly upon the completion of copying or after a long time lapse, although it seems that biblical copies were of little use with no vocalization, and therefore vocalization and Masora must have been added soon after the copying. Meir ben Yaʿaqov HaSofer completed the copying of MS Berlin, Ms. Ham. 80 (2) for Avraham ben Nathan in 5050 (1289/90), apparently in Germany (colophon on fol. 255v). On the page preceding the colophon the vocalizer-Masorete Hayyim ben Shneʾur wrote that he had completed the vocalization and the Masoretic annotations of the entire Bible (עשריʼ וארבע) in 5052 (1291/2), more than a year after the

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19 The original name was erased and in its stead another hand inserted a different name, גרשום, which was the name indicated by the vocalizer-Masorete (גרשם). The scribe may have made an error, which was later corrected, or the manuscript may have been destined originally for another son of Eliezer, but in the process of vocalizing and annotating it its destination had been changed.

copying had been completed. The said MS Berlin includes two volumes, and although Hayyim ben Shne'ur noted that he vocalized and annotated an entire Bible, it should not be understood from this statement that he vocalized and annotated the first volume - MS Berlin Ms. Ham. 80 (1) - since the Masorete for this volume had disclosed his name as יעקב (Ya'aqov). The two separate volumes do not combine to form a complete Bible,[20] yet if indeed the second volume did contain a full Bible, it is no wonder that the vocalization and Masoretic annotation lasted over a year.

Besides biblical books, in which the vocalization and cantillation constitute an inseparable part of the text, prayer books, maḥzorim, and siddurim were also vocalized. The vocalization of liturgical texts had, no doubt, practical functions, for it was meant to facilitate the pronunciation and the comprehension of the prayers, in particular the *piyyutim*, which language was often intricate. As with biblical codices, the copyist of a maḥzor would also vocalize it, but sometimes vocalization would be added by a separate vocalizer who would inscribe his own colophon (in Ashkenaz and in Italy).[21]

Another craftsman working in collaboration with the copyist or vocalizer-Masorete was the illuminator, who decorated the manuscripts with calligraphic flourishes, illustrations, and ornaments. Only a few illuminators wrote colophons or are known to us by name. No doubt, most of the illuminators of lavish Hebrew manuscripts in France, Germany, and Italy were Christian artists who illuminated the manuscripts or decorated the initial words in local ateliers, under the guidance of the Jewish copyist or manuscript owner.[22] At the same time, it can be said with near certainty that the decorations (and even illustrations) of manuscripts, especially those with pen flourishes, were executed by their scribes. Many Masoretes, both in the Orient in the tenth and early-eleventh century and later in Spain and Ashkenaz, decorated the biblical codices they annotated by shaping the Masora (inscribed in minute script) into geometrical or mixed floral and

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20 On the erroneous pairing of two biblical volumes in MS Berlin Ms. Ham. 80, and on their contents, see below, n. 104.

21 E.g. in MS Rovigo, Accademia Silvestriana 216, produced in Germany in 1272, two colophons were written on fol. 324v: the first by the scribe (who accidently omitted from the date the numeral indicating decades) and the other by the vocalizer, who began to vocalize the maḥzor some two weeks after its copying had been completed: אני. עד שיעלה חמור בסולם, לא היום ולא לעולם, לא יזק הסופר ונתחזק חזק אליקים ב״ר דוד סיימתי זה המחזור לר׳ יואל ב״ר משלם בשנת חמשת אלפים <ושלושים> ושתי שנים לבריאת עולם ביום ו׳ שמונה ימים לירח אלול. וכשם שזכיתי לכותבו כך תהי לו זה המחזור ולבניו אחריו עד סוף כל הדורות. ואני מרדרור <=מרדכי> הקטן סיימתי לנקדו ביום א׳ בראש חדש מרחשון תחילת שנת ל״ג לפרט והתחלתי בו ביום א׳ כ״א בחדש אלול בשנת ל״ב ברוך נותן ליעף כח ומרבה עצמה לאין אונים ויהי רצון מאת שוכן מעונים לזכות בעל המחזור הזה לבנים ולבני בנים הוגי יקרה מפנינים ועושר וכבוד ואורך ימים ושנים. ואותי יזכה לשבת תחכמונים ולחם חוקי יטריפני בלי בושת פנים בכל עת ועידנים, וגם יזכיני לבנים, לומדים ושוננים תורת אל בהגיונים בכתב ובעל פה משננים. אמן סלה.

22 See Beit-Arié, East and West, pp. 20-23.

geometrical patterns (in the Orient and Sefarad), into figures of mythological or even realistic animals, and even in the form of text illustrations (in France and Germany). There, during the thirteenth and fourteenth centuries, some Masoretes would write a colophon, or their name, or the name of the patron, in the upper and/or lower margins, using hollow characters which outlines were formed from the text of the Masora magna. Sometimes they would also decorate and colour the numbering of the *sedarim*, the names of *parashot*, and the tallies of the verses, as well as create pages of interwoven verses in carpet-patterns, and even draw illustrations of the holy vessels of the sanctuary and temple (which apparently explains the wording used by the vocalizer-Masorete Ephraim ben Buya'a, who also decorated the Pentateuch copied in 929 by his brother, the scribe of the Aleppo Codex).[23]

An impressive example of the collaboration among scribe, Masorete and artist is found in MS Hamburg Cod. Levy 19, a richly illuminated Pentateuch with Onkelos' translation, *Haftarot*, the five scrolls, and the book of Job with Rashi's commentary in semi-cursive script. The scribe, Yitsḥaq ben Eliyahu Ḥazzan of Oxford (אוכשונפיורט[24]), who had presumably been expelled from England during the general expulsion of 1290, completed the copying of this superb biblical reading-corpus in Brussels in 1309.

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23 On the word וכללתי in the sense of 'I decorated, beautified', see above, n. 18. On the writing of the Masora (and other texts) in the form of decorations and illustrations and on the art of micrography in Hebrew manuscripts, see the study by Lila Avrin. C. Sirat, La lettre hébraique et sa signification; L. Avrin, *Micrography as Art*, Paris–Jerusalem 1981, pp. 43–89, Pls. 1–118. See also the summary on this Jewish form of art by D.-R. Halperin, *Illuminating in Micrography: The Catalan Micrography Maḥzor, MS Heb. 8°6527 in the National Library of Israel*, Leiden 2013, pp. 5-21

24 See S. Birnbaum, 'Hebrew Manuscripts of Norman England', Notes and Queries, 146 (1934), pp. 236–239. Most of this article is devoted to philological proofs of this identification (supported, according to the author, also by identification of the script), and to the refutation of the identification with Ochsenfurt near Würzburg. Cf. Beit-Arié, Makings, p. 130.

At the end of his manuscript he inscribed a colophon (fol. 625r, containing most of it) decorated with an unusual illustration of a dignitary (presumably חיים בן הק׳ חיים,[25] for whom the manuscript was produced). Underneath the illustration a second rhymed colophon in ornate language is inscribed in miniature script, and is integrated within the ornate borders which surround the page:

הנני העקוד המר אודה אדון עולם / נתן בלבי בין לעשות מלאכה דא | ציור
והכתיבה שיל-מתי יחד בזמן אשר מנוי כי״ס בטב גדא / יירש וגם יהנה בו
איש אשר הכתיב נקרא ר׳ חיים יחיה בלי טרדא | כל איש אשר יראה זה י-
היה חפץ / יהנה לשנות בזמן כל כלי חמדה | לכבוד יקר אלי תורה ולקח
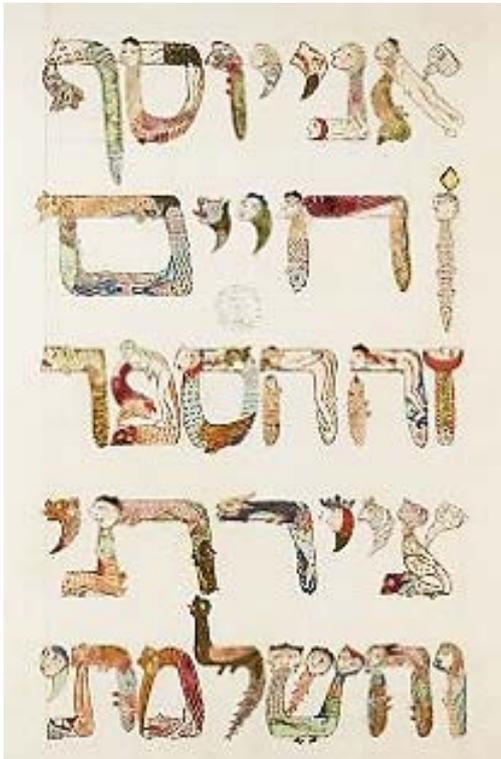
טוב / פע-לתי יופי כן היא בלימודה |
פועלה הלא יחיש ישע לנהלנו / בעגל
בעיר שלם ישבה כגלמודה[26]

MS Oxford MS. Kennicott 1,[27] a Bible beginning and ending with quires

25 The title given to the owner's fa... son, born after his death, was theref...

26 The name of the Masorete wa... decoration of these words in the text of the Masora (for this practice used by scribes and Masoretes, see below, in the appendix to this section). For more details on the colophon, see below chapter 11, n. 135. The wording ציור והכתיבה might have indicated the work of the Masorete - who was keen on inscribing the Masora in unique animal shapes, surrounding them with red ink; however, since the hand of this colophon is not similar to that of the Masora script it seems that it was the artist who inscribed this last (additional) colophon, given that the expression פעלתי יופי is well-suited to his outstanding illustrations and illuminations.

27 Neubauer Catalogue 2322. Facsimile edition of the manuscript: The Kennicott Bible with a Commentary Volume by B. Narkiss & A. Cohen-Mushlin, London 1985.

containing *Sefer HaMikhlol*, by David Kimḥi, was copied in La Coruña, Galicia (northern Spain) in 1476 by Moshe ben Yaʿaqov Ibn Zabara HaSofer for Yitsḥaq ben Shelomo de Braga. It was richly decorated by Yosef ibn Ḥayyim, who wrote his own colophon in large characters at the end of the manuscript (fol. 447r), noting that he had illustrated the book: אני יוסף ו' חיים זה הספר צייירתי והשלמתי. Even in the mere writing of the colophon the artist did wonders, displaying his artistry and his humorous and playful creativity in designing anthropomorphic and zoomorphic characters.[28]

The Haggada kept at the Jewish Theological Seminary in New York, MS New-York MS 8279 is an example of a manuscript which, according to its colophon, was produced by a professional scribe whose expertise comprehended all three scribal functions, resulting in the production of a high-quality codex. This Haggada was copied, vocalized, and illustrated in Italy by the famous scribe and illuminator Yoʾel ben Shimʿon of the Rhineland, in 1454: אני הלבלר יואל ב"ר שמעון ז"ל, המכונה וייבש אשכנזי מעיר קלונייא על נהר רינוס, כתבתי נקדתי וצייירתי ההגדה זה <!> וסיימתי אותו <!> בירח אילול שנת רי"ד לפרט (fol. 9r).[29]

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28 In the wording of the colophon and the design of its characters, the illuminator Yosef ibn Ḥayyim had in fact imitated the style of the illuminator Yosef HaẒarfati. The latter wrote an identical colophon with similarly styled characters at the end of a Bible kept in Lisbon, Bib. Nacional, Illuminado 72, copied in Cervera, Spain in 1299/1300 and annotated in Tudela by the Masorete Joshua Ibn Gaon, a master of micrography (for a summary about the manuscripts he annotated with micrography, a few of which he may have illustrated, and about their colophons, see K. Kogman-Appel, Jewish Book Art Between Islam and Christianity: The Decoration of Hebrew Bibles in Medieval Spain, Leiden 2004, pp. 98–130). In the Lisbon manuscript, Ibn Gaon incorporated into the micrographic Masora 20 mentions of his name, or regular colophons, with dates, indications of locality, or the name of the owner (erased in the scribal colophon). See T. Metzger, 'Josué ben Avraham ibn Gaon et la "massora" du Ms. Iluminado 72 de la Biblioteca Nacional de Lisbonne', Codices Manuscripti, 15/5 (1990), pp. 1–27. Joshua Ibn Ga'on did not only annotate the Masora, draw micrographic illuminations, and illustrate, but apparently also copied MS Paris Hébreu 20, see recently, J. Del Barco, Bibliothèque nationale de France – Hébreu 1 à 32 (Manuscrits en caractères hébreux conservés dans les bibliothèques publiques de France: Catalogues 4), Turnhout 2011, under the entry for this manuscript. On the other hand, MS Hébreu 21, a Bible in which Joshua inscribed the Masora and also its copying was attributed to him (according to a colophon intertwined in the decorated Masora) - was in fact not copied by him, as demonstrated by the comparison of the script and para-scriptural traits (see Manuscrits médiévaux I, 25). For eight explicit colophons by illuminators, some of whom were also Masoretes, and on scribes who seem to have illuminated manuscripts they copied, see Y. Zirlin, 'Celui qui se cache derrière l'image: Colophons des enlumineurs dans les manuscrits hébraïques', REJ, 155 (1996), pp. 33–53.

29 Yoʾel copied, vocalized, and illustrated another manuscript without mentioning this in the colophon. For Yoʾel, see above, chapter 1, n. 153. Recently a new edition of the Washington Haggada, with an introduction, has been published: The Washington Haggadah, Copied and Illustrated by Joel ben Simon, English transl. by D. Stern, Introductions by D. Stern & K. Kogman-Appel, Cambridge, Mass.– London – Washington 2011.

The proofreading of the copy was an additional stage of manuscript production which only a small number of colophons mention. In biblical manuscripts, containing both vocalization and Masoretic annotations, the meticulous copying of which was a basic requirement, the proofreading of the copy is mentioned in a number of tenth-century Oriental colophons, namely the era in which the widespread distribution of biblical codices was undertaken.[30] These manuscripts were proofread either by vocalizers-Masoretes or by scribes who did the vocalizing and added the Masora; this practice is evidenced also in late copies of the Bible produced in Yemen. One case of a unique, lengthy colophon has survived, written in 960 by the proofreader of a copy of Hagiographa inscribed in the Middle East.[31] In some biblical manuscripts produced in other areas scribes would mention proofreading their own copying; as, for instance, Elisha ben Shemu'el, who copied a Pentateuch in Toledo in 1256 and proofread it in accordance with the proofread codices kept in Toledo and under the supervision of local scribes.[32] Most of such manuscripts were produced in Spain, and some in Byzantium.[33]

Remarkable for their mention of the proofreading of non-biblical texts are a group of more than twenty manuscripts, all Oriental - apart from two that were copied in Muslim Spain – and most of them in Judaeo-Arabic. The fact that these manuscripts, most of which were dated, were checked as against the *vorlage*, possibly a proofread and authorized model-text, was indicated in Judaeo-Arabic (and sometimes in Arabic, in Arabic script) by means of a brief formula known from similar indications in Arabic manuscripts. Some of these indications were inscribed apart while others appear in colophon format. Either way, they demonstrate that the proofreader was not the scribe. Sometimes, however, the annotations were incorporated in the scribe's colophon or added in his own hand, thus indicating that he himself proofread his copying upon completing it. The first instance of this kind of Arabic annotation appears, unexpectedly, in a biblical manuscript – the oldest extant manuscript of a whole Bible ("MS

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30 See Codices hebraicis, Part I, mss. 5, 6, 8, 10, 17.

31 MS St. Petersburg Евр. II B 281 (See Codices hebraicis, Part I, Manuscrix 10); of the Hagiographa manuscript only one page remains, containing a long colophon by the proofreader.

32 MS Parma Parm. 2025 (See the colophon in the Richler & Beit-Arié Catalogue [Parma], 38).

33 MS Paris Hébreu, 17-18 displays an example of the proofing of an Ashkenazic Bible and its Aramaic translations copied circa 1300, which was performed just after it was purchased in 1512 in Governolo, near Mantua. At the end of each volume the proofreader Menaḥem ben Perez Trabot wrote a colophon. The colophon of the second volume (p. 370) notes that he proofed with maximum accuracy, according to the accurate models in his possession (בדיוק היותר אפשרי ועם ספרים מדוייקים היו אתי בעת הזאת) in the home of the owners Yosef, Moshe, and Shemu'el, sons of Yitsḥaq Gallico.

Leningrad") dated 1008. In several spots the proofreader wrote קובל.[34] The full proofreading formula was inscribed in Arabic script by the proofreader of a manuscript containing two works of Shemu'el ben Ḥophni Gaon, copied in 1035: קובל פצח, i.e. the copy had been compared and it was correct.[35] Such an annotation in Arabic script was inscribed also in the earliest extant dated manuscript from the Iberian peninsula – a manuscript of a grammatical work in Judaeo-Arabic, copied in 1119 in Valencia while still under Muslim rule.[36] Similar phrasing was used by the copyist himself in his proofreader's colophon, which he added to his scribe's colophon: צחחה מבורך בירבי משה.[37] Phrases such as קובל וצח were used by scribes (proofreaders) in other manuscripts.[38] Another formula confirming the comparison of the copy to the model – בלגת אלמקאבלה – appears in the proofreading annotations of several manuscripts: its first occurrence was in the Orient in a Judaeo-Arabic manuscript from 1119/20,[39] and its last occurrence - in Granada, at the end of a colophon of a Judaeo-Arabic manuscript dated 1399.[40] Similar usage of a proofreader's colophon appears in a Judaeo-Arabic

34 MS St. Petersburg Евр. I B 19a (See Codices hebraicis, Part I, Manuscrits médiévaux 17).

35 MS Cambridge T–S Misc. 35.1 (See Codices hebraicis, Part II, Manuscrits médiévaux 27), and see ibid., the reference to the book by Shraga Abramsohn, who translated the formula. In the colophon of a Geniza fragment of Maimonides' commentary on the Mishna in Judaeo-Arabic, from 1187 (MS Paris, AIU V B 55), the scribe noted that his copying was proofread according to Maimonides' original Hebrew manuscript, although the term he uses is an Arabic loanword: והגהתי אותו על האום כפי היכולת. For the meaning of the word אום in Arabic see Manuscrits médiévaux, Part II, 4. For other copies proofread according to Maimonides' autographed manuscripts, see below, n. 38.

36 MS St. Petersburg Евр.-Араб. I 2440 (See Codices hebraicis, Part II, ms. 57).

37 MS St. Petersburg Евр.-Араб. I 1404 (See Codices hebraicis, Part IV, Manuscrit 77).

38 Proofreaders' colophons employing this formula were inscribed in an undated Oriental manuscript of Maimonides' Guide for the Perplexed, split into two sections – MS Oxford MS. Hunt. 165 (Part 2, with a colophon at the end by a Yemenite copyist, who clearly was active outside of Yemen, and a colophon by the proofreader, in large square characters!) and MS St. Petersburg Евр.-Араб. I 3123 (end of part 1, including a colophon by the same copyist and 3 colophons by the proofreader, one of them in Arabic script). According to the proofreader – Yosef ben Ya'aqov HaMa'aravi – in the colophons of the St. Petersburg part, the manuscript had been examined as against Maimonides'original manuscript. For a review of the many direct and indirect evidences about parts of Maimonides' *Mishne Tora* that were proofread according to Maimonides' autographed manuscripts or manuscripts bearing his own signature, aside from the famous authorization הוגה מספרי אני משה ברבי מימון (proofread according to my own autograph, Moshe son of R. Maimon) in MS Oxford MS. Hunt. 80, see S.Z. Havlin, ed., The Authorized Version of the Code of Maimonides: the Book of Knowledge and the Book of Love, Facsimile edition of MS Oxford, Huntington 80 and addenda, Jerusalem-Cleveland 1997 (in Hebrew), pp. 23-26.

39 The full formula of the proofreading annotation read: בלגת אלמקאבלה בחמד [אללה] וחסן עונה (<here ends> the comparison <of the versions> in praise of God and the beauty of his succour); MS St. Petersburg Евр.-Араб. I 4175 (See Codices hebraicis, Part III, Manuscrit 59).

40 The text reads as follows בלגת אל מקאבלה פי שהר אדר (MS Paris Hébreu 578; see Codices hebraicis, Part I, ms. 67. Joseph Fenton drew my attention to MS Oxford MS. Hunt. 382, deriving apparently from 15th-century Aleppo, in which בלגי מקא is inscribed in red ink at the bottom of the last page of every quire. No doubt, this phrasing is an abbreviation of the formula above.

fragment of the commentary of the Karaite Yefet ben 'Eli on Jeremiah, dated 1183: וכמל
מקאבלה אלגזו בעון אללה יום אלתלתה אלתאלת ועשרין מן שהר אלול שנת אלף וארבע מאות
ותשעים לשטרות מן תצניף המלמד הגדול מלמד מלמד הגולה ומזהירה יפת בן עלי הלוי[41].

Apart from evidence of proofreading found in biblical manuscripts and in the Judaeo-
Arabic manuscripts mentioned above, only few proofreading annotations are not
rhetorical in nature, and most are late. Nearly all were written by the scribe himself as
part of the colophon. In some colophons, particularly from Spain and Provence, the
copyist or vocalizer noted that they had proofread their copying as against several
copies; thus, for instance, in a manuscript of the commentary on the Pentateuch by
Avraham Ibn Ezra, produced, no doubt, in Provence in 1445, we read that the
proofreader used two model copies: והגהתי אותו משנים פירושים מדויקים ומוגהים על
הנכון[42]. Similarly a vocalizer in Avignon, who vocalized and proofread in 1453 a
maḥzor according to the rite of Avignon, wrote in the colophon: נקדתי והגהתי זה הסדר
כפי מה שמצאתי בסדרים <...>[43].

Evidently, proofreading annotations survived especially in the zone of the Muslim
countries of the Middle East and in Muslim Spain, yet only rarely in Italy with its
multitude of manuscripts. Apparently they never existed, or did not survive, in
Ashkenaz (Germany and France). One, and possibly the single, example of a
proofreading annotation by a German copyist appears in a colophon of a manuscript
dated 1408. The anonymous copyist wrote: ליל י"ז שבט ליל ב' קס"ח אחר גמרתיהו חזרתי
והגהתיו[44].

Two late manuscripts are exceptional in that they contain, in addition to the copyist's
colophon, a regular colophon inscribed by the binder. One was copied in Lecce in
southern Italy by two Sefardic hands and was completed in 1485. According to the
binder's colophon, the binding was completed six months later. Conflating two biblical
verses (Psalms 131:1 and Isaiah 38:14) he wrote: [45]

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41 MS St. Petersburg Евр.-Араб. II 2183, fol. 2r. Another folio from this copying is found in the same
library: MS St. Petersburg Евр.-Араб. I 1866 (See Codices hebraicis, Part IV, ms. 80).
42 MS Oxford MS. Poc. 393 (Neubauer Catalogue 217).
43 MS Paris Hébreu 631.
44 The manuscript was formerly kept in the collection of the Vienna Jewish Community (Schwarz
Catalogue, 85) and nowadays is privately owned.
45 MS Parma Parm. 1782 (Richler & Beit-Arié Catalogue [Parma] 1089). The binder's hand in the
colophon is not identical to that of MS Vienna, ÖNB Cod. Hebr. 27 (Schwarz Catalogue 161), copied in
1472 by a scribe of the same name.

קשרתי אני קרשקש קלונימוס זה הסדור לבחור <...> השי<ם> לרוב רחמיו יזכהו לקרא
הוא וזרעו <...> יום שני לחדש ניסן שנת רמו עיני למרום

In 1512, Crescas ben Shne'ur Sidis (סידיש) completed the copying and binding of a
scientific manuscript in Salonika, as witnessed in his colophon: כתבתיו וקשרתיו.[46]

Components of the names

Usually the name of the manuscript's copyist (or owner) was followed by his father's
name, and sometimes his grandfather's, or even by names of several generations back;
often, especially in the Muslim countries in both Occident and Orient, a non-Hebrew
surname or appelation would be added as well. Accordingly, in the colophons cited
above we encounter the names מבורך הכהן בן יוסף הידוע בן אזדאד בן בקהיר and בנימן המנקד
בן יואב המנקד ממשפחת העניים באיטליה in Italy. MS New York R 934 was copied by a
scribe who uses two surnames: בנימן בכהמ״ר יצחק ישר״ו בכ״ר בנימן בה״ר שלמה בה״ר
יהודה בה״ר בנימן פינצי בה״ר מנחם זלה״ה ממשפחת ר״ם. Many colophons, from Italy in
particular, denote the scribe's or the patron's exact provenance – the name of the town
which in fact, as was customary in Italy, would at some stage become a surname: e.g.
Yekuthi'el ben Shelomo of Bevagna who was commissioned to copy a manuscript in
Rimini in 1378,[47] or Meshullam of Velletri, who copied *seliḥot* (penitential prayers) in
1418.[48] The latter copied two other manuscripts in Mantua, one in 1417 and the other
in 1419;[49] presumably the *seliḥot* manuscript had also been copied in that location. This
phenomenon is known in Ashkenazic colophons as well, but it appears that denoting
one's provenance from a town in France or Germany was not equivalent to using a
surname, but rather conveyed information about moving out or emigrating from those
places, even to other countries. This is the case in the illuminated colophon written by
Yitsḥaq ben Eliyahu Ḥazzan of Oxford (אוכשונפיורט), just as in the colophon of Yo'el
ben Shim'on of Cologne (יואל ב״ר שמעון ז״ל המכונה וייבש אשכנזי מעיר קלונייא על נהר

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46 MS New York MS 2623, copied by a Sefardic hand. In 1504 Shimshon ben Eliya Ḥalfan wrote in
Italy for his own use a multi-layered manuscript (a prayer-book containing Job, Proverbs, and Psalms in
the external margins, and the Five Scrolls, Tractate Avot, and special prayers on the upper and lower
margins) in Italian and Sefardic scripts (MS Parma Parm. 1739).In the colophon he indicated: אני שמשון
בכ״מ אליה חלפן צרפתי זלה״ה כתבתי זה הסידור עם כל הדברים הנכרכים סביב וגם נקדתי אותו ועשיתיו לעצמי
להתפלל בו ונשלם בקשירתו ובעטיפתו יי״א מרחשון רס״ה. It is unclear whether he meant to say that he himself
had bound the manuscript. The same copyist was at the same time a hired scribe as well: in 1506 he
copied a manuscript for a patron in Merano in northern Italy (MS Copenhagen, Royal Library Cod. Hebr.
Add. 4).
47 MS Paris Hébreu 401 (See Manuscrits médiévaux, I, ms. 50).
48 MS Vienna, ÖNB Cod. Hebr. 187 (Schwarz Catalogue 97), fols. 1-79.
49 See Manuscrits médiévaux II, 54, 56.

רינוס), both mentioned above. In colophons inscribed by Spanish and Provençal (and to a lesser degree also Ashkenazic) immigrants in Italy from the end of the fourteenth to the end of the fifteenth century one finds numerous mentions of provenance of the copyists from these countries, denoted either generically ('French', [צרפתי] 'Ashkenazic' [אשכנזי] 'of the nations of Provence' [מעמי פרווינצה], as indicated by Avraham ben Mordekhai Farissol of Avignon in one of his colophons), or specifically. The copyist of the core text of MS Prague, VII 10 (nowadays deposited in the Library of the University of Wrocław)[50] – inscribed in 1439, no doubt in Italy - indicated in the colophon his provenance in Regensburg <רעגנשפורק: אני שמעון סופר בכמ״ר עזריאל ישר״ו אשכנזי מרעגשפורק ממשפחת איגר סיימתי זה הספר בראש חדש אייר (fol. 241v). Another colophon of an immigrant copyist in Italy, in which he details his city and province of origin, is found in MS Paris Hébreu 1186:

אני חלפתא הסופר ב״ר אברהם הסופר ממחוז פרווינצה וארץ מולדתי עיר מרשלייא כתבתי
זה הספר הנקרא שושן הרפואה אל הרופא המובהק מאי<שטרו> יוסף פרייר יצ״ו היושב
באנקונה העיר ההוללה והיתה השלמתו פה מונדאביאו <Mondovi> בשמנה ועשרים יום
לחדש סיון שנת אני בי'צי'די'קי' אחזה פניך השם ברחמיו יזכהו להגות בו ולהבין סודות
רפואותיו וחפץ השם בידו יצלח ויקיים בו מקרא שכתוב כל המחלה אשר שמתי במצרים
לא אשים עליך כי אני ה' רופאך, כן יהיה אמן (fol. 217r).

A few of the non-Hebrew surnames, including cases in which a non-Hebrew name is attached to the scribe's or owner's first names, are preceded by the denotation המכונה ('who is called' = known as), as in the full name of the scribe of the biblical codex copied in 929 in Palestine, and cited above: שלמה בן בויאעא הלוי תלמיד סעיד בן פרגוי המכונה בלקוק. Such annotations are very rare amongst Italian copyists, a few of whom adopted it in the second half of the fifteenth century in imitation of the Spanish, Provencal and German immigrant copyists, who used it extensively. Thus we find in Ashkenaz in 1310: שמשון הסופר ב״ר יעקב זצ״ל המכונה ויואנט החוקק חותמות (Shimshon the scribe ben Ya'aqov known as Vivant the seal maker).[51] In Provence and in Spain many Jews had a double name and surname, Hebrew and non-Hebrew: משה בן מנחם דאלבורנש completed in 1322 a decorated biblical manuscript for Mordechai ben

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50 Formerly at the Rabbinical Seminar in Breslau, Loewinger & Weinryb Catalogue 4. On the migration of the manuscripts from the Rabbinical Seminar in Breslau to Prague and then back to Wrocław (Breslau), see above, n. 11

51 A biblical reading corpus, MS London Add. 10455. His non-Hebrew name is followed by the mention of his additional trade, in Hebrew.

completed in חיים בן שאול מגדולי המכונה וידאל סטורי דוראן דשפונץ;[52] Yitshaq, known as 1404 a copying in Saragossa (סרקסטא).[53] Modifiers preceding Arabic names, especially הניכר or הידוע, were in use in the Middle East mainly among Karaite scribes, sometimes הידוע/הניכר בבן/באבן.

Sometimes names were followed by a designation of occupation (apart from 'the scribe' or 'the vocalizer' [הסופר, הלבלר, המנקד]), such as הרופא (the physician), relatively common in Italy, or המלמד (the teacher) in the Middle East.

Blessing formulas for the living and the deceased

Names were usually accompanied by blessing formulas for the living and the deceased, often represented in acronyms, many of them based on biblical verses.[54] Some were particular to one geocultural zone, some were used in two zones only, and others - while being practiced in most zones were characteristic of particular regions. Obviously, it was not only copyists who used these formulas in their colophons, for they were used (presumably with similar distribution) in other texts as well; yet their numerous occurrences in thousands of colophons, alongside of their classification, reveal patterns of usage that can help in identifying the provenance of a codex and of texts in general. Here follows a selection of formulas.

Blessings for the living

ס״ט namely סופו טוב, or in Aramaic סופא טבא, סופיה לטב – A blessing formula used in Muslim lands only:[55] in the Middle East (except Yemen) from the beginning of the eleventh century, and in Spain and North Africa from the beginning of the thirteenth century.

נר״ו (נטריה רחמנא וחנניה/וסייעיה, etc.) – A well-known blessing, rather rare in medieval colophons. It was used by copyists from all zones, except for Yemen and Ashkenaz, and more so by Sefardic copyists, even outside Spain.

יצ״ו (ישמרהו צורו וגואלו) – **C**ommon in all zones, especially among Sefardic copyists, wherever their location.

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52 MS Jerusalem Heb. 4° 780 (See Manuscrits médiévaux I, 31).
53 MS Paris Hébreu 31 (See Manuscrits médiévaux II, 45).
54 Zunz already devoted considerable discussion of these formulas in his book Zur Geschichte, pp. 304-389.
55 As can be expected it appears, as from the end of the 15th century, in colophons inscribed by immigrants from Spain or Sicily in southern Italy.

י״ץ (ישמרהו צורו) – This formula evolved, presumably, as an abbreviated form of יצ״ו, though it first appeared in Ashkenazic colophons. It was used in Italy, especially in the second half of the fifteenth century (compare above, chapter 1, n. 142).

ש״צ (שמרהו צורו) – Used only in Muslim lands, both in the Orient and Occident.[56]

ישר״ו (usually deciphered as יחיה שנים רבות וטובות) – An exclusively Italian formula which first occurred in a colophon from 1332, and which appears in eleven percent of Italian colophons (the rate is even higher, if we exclude manuscripts by immigrants' hands).

יזי״י (ירארה זרע יאריך ימים [Isaiah 53:10]) – A common formula exclusive to Italy.[57] Its first extant occurrence was in 1289. From 1387 we find in two-thirds of Italian colophons which contain it a variety of the blessing, יזיי״א, with an added א (aleph) at its end for the word *amen*.[58]

י״ל (יחיה לעד) – In use in all zones except for Yemen, but especially in Byzantium. At first was was employed only in its full form.[59]

שלי״ט (שיחיה לאורך ימים טובים) – A formula of relatively limited use, in Germany and Eastern Europe only from the end of the fourteenth century, and in Italy during the latter third of the fifteenth century among immigrant scribes using the Ashkenazic script.

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56 See M.R. Cohen, 'On the Interplay of Arabic and Hebrew in the Cairo Geniza Letters', in Studies in Arabic and Hebrew Letters in Honor of Raymond P. Scheindlin, ed. J.P. Decter & M. Rand, Piscataway, N.J. 2007, pp. 29–30. And see ibid., discussion of the Aramaic equivalent נטריה רחמנא (mentioned above) in Geniza letters.

57 Copyists outside Italy sometimes used the full verse as a blessing for the living, but not in the form of an acronym. In MS St. Petersburg Евр. II C144, copied by a Maghrebi scribe in Alexandria in 1122, the copyist cited the full verse ימים וחפץ ה׳ בידו יצלח <...> יראה – without adding אמן (Amen) (See Codices hebraices, Part III, Manuscrit 60). A few Italian scribes from the end of the 13th century until the beginning of the 15th century used as a blessing formula only the second part of the verse, in acronym form – ויב״י.

58 MS Parma Parm. 1119, copied in Bologna. A singular use of the formula outside Italy is found in the problematic colophon inscribed by Avraham <ben> Mordekhai Farissol, apparently in Avignon in 1467/8, before immigrating to Italy where he copied sixty manuscripts that survive to this day. The colophon appears in MS Parma Parm. 1957, which contains a collection of works, most of them copied in Italy by Farissol or by his disciples, under his guidance, at different periods of time (for a detailed codicological description of this composite collection see the Richler & Beit-Arié Catalogue [Parma], 1349). This colophon relates to a text bound at the beginning of the codex. Farissol did not copy this text but just inscribed its initial words and, for some reason, he chose to write a colophon at its beginning. It is possible that Farissol added this opening colophon, which documents his activity in Avignon, after having immigrated to Italy as he became aware of the Italian formula? (His first dated manuscript in Italy was copied in Mantua in 1470 – MS Oxford MS. Opp. Add. 4° 177, Neubauer Catalogue 2567).

59 See Codices hebraices, Part II, Manuscrit 24, from 1029.

The following are a few rare formulas:

צב״י (צדיק באמונתו יחיה [Habakkuk 2:4]) – Appears only in a few European manuscripts (excluding Byzantine ones).

אי״ש חי״ל ארך [according to the verse in Proverbs 3:2: ארך ימים שנות חיים יוסיפו לך) (**ימים שנות חיים ושלום יוסיפו לך**) – This charming formula, which puzzled many who attempted to decipher it, some assuming it to be a Hebrew translation of a surname until Zunz unlocked its meaning,[60] occurs only in few European manuscripts, most of them from France.

ממקומ״י (מחץ מתנים קמיו ומשנאיו מן יקומון [Deuteronomy 33:11]) – Appears in a few colophons from the Orient, Byzantium, and Morocco in the latter third of the fourteenth century and during the fifteenth century.

לשי״ש (לפני שמש ינון שמו [Psalms 72:17]) – Found in one colophon only, inscribed in 1448 in a Sefardic script by the grammarian and scribe Yitsḥaq Zark in Ferrara (MS Paris Hébreu 933).

At the end of the fifteenth century, as more manuscripts were being copied for women, two special blessing formulas came into use:

מב״ת (מנשים באהל תברך [Judges 5:24]).

תמ״א (תברך מנשים אמן) – Also borrowed from the same verse in the Book of Judges.

Blessings for the deceased

ז״ל (זכרו/זיכרונו לברכה) – The most common formula in dated colophons, employed in all zones and especially in Italy and Spain. In the Orient, where the earliest manuscripts originated, it appears as early as the eleventh century.

זצ״ל (זכר צדיק לברכה [Proverbs 10:7]) – An expanded form of ז״ל (or perhaps conversely, ז״ל is an abbreviation of זצ״ל which is based on the Scriptures), and almost as common as the former;, also employed in all zones, but more frequent in Italian colophons.

זצו״ל/זצוק״ל (זכר צדיק וקדוש לברכה) – An expanded form of the זצ״ל formula.

זלה״ה (זכרונו לחיי העולם הבא) – Frequent in all zones, especially common in Italy and less so in Ashkenaz and in the Orient.

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60 Zunz, Zur Geschichte, pp. 302, 305 (Zunz erred in his citation of the verse אך ימי שנות חיים יוסיפו לך). See Manuscrits médiévaux, Part I, 6, 11).

ע״ה (עליו השלום) – First documented in a Sefardic manuscript from 1225, and used until 1540 (the last year for which a dated manuscript is documented) in sixty colophons from Spain and Italy and in some manuscripts from other zones (a few of them from Byzantium).

נ״ע (נוחו עדן) – One of the most frequent formulas, which seldom appears in its full form. Employed in all zones but only to a limited extent in Ashkenaz and Yemen. In the Orient it occurs as early as the eleventh century.

תנצב״ה (תהי נשמתו צרורה בצרור החיים [according to I Samuel 25:29]) – A fairly frequent formula (always as an acronym), especially in the Orient. It appears for the first time in MS St. Petersburg Евр. II B 8, copied by a Maghrebi scribe in Palestine in 1020/11. In Ashkenaz it is found in one colophon only.[61]

The following are less frequent blessing formulas for the deceased:

נבתויי״א (נפשו בטוב תלין וזרעו יירש ארץ [Psalms 25:13]) – Represented in all zones, sometimes occurring in the abbreviated form: **נב״ת**.

רי״ת (רוח ה׳ תניחנו [Isaiah 63:14]) – Appears in colophons from Muslim lands from the eleventh century onward, and most conspicuously in Yemen.

מב״ע (מנוחתו בגן עדן)– Occurs in Italian colophons.

נע״ג (נוחו עדן גן) – Occurs in Yemen only and sometimes as **נג״ע** representing an alternate word order. In MS St. Petersburg Евр. II C144, copied by a Maghrebi scribe in Alexandria in 1222, the full form נוחו גן עדן appears.

מנוחתו **תמ״ך** or **מ״כ** (תהי מנוחתו כבוד) or in abbreviated form **תמ״ך** or **כבוד** – A formula documented as early as the twelfth century in the Orient and from the thirteenth century onwards is also documented in other regions.

יש״י עמה״ן (יבא שלום ינוחו על משכבותם הלך נכֹחו [Isaiah 57:2])[62] – A rare formula occurring in seven dated colophons and in another three undated colophons. Eight of these were inscribed in Spain or by a Sefardic immigrant scribe, from mid-fourteenth century and until 1479.

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61 In MS Parma Parm. 2765 (De-Rossi Catalogue 542), copied in Germany in 1384/5. Its single occurrence is puzzling given the prevalence of this formula (especially in its full form, sometimes combined with another blessing) on tombstones in Germany throughout the 13th century; See A. Reiner, 'From "Paradise" to "Bound in the Bonds of Life" - Blessings for the Dead on Tombstones in Medieval Ashkenaz', Zion, 76 (2011), pp. 6-10 (in Hebrew).
62 Cf. B. Berakhot 104a.

It seems that, at least in Italy, certain blessing formulas were used exclusively by certain copyists (male and female), then to be adopted by other copyists. It seems that such were the formulas used by the Italian copyists Menaḥem ben Binyamin in the late thirteenth century[63] as well as those used by Paula *bat* Avraham ben Yo'av, the woman-scribe who was active in Rome during the same period and even produced a codex for the same Menaḥem ben Binyamin.[64]

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63 Four manuscripts copied in Italy between 1285 and 1289 by a copyist named Menaḥem ben Binyamin have survived: MS Paris Hébreu 1221, copied between 1285 and 1287; a manuscript copied during the years 1286-1287 (in the copying of which another copyist participated) survived nearly in its entirety in MS Parma Parm. 2784 while part of the missing section at its beginning was identified in MS New York MS 8124 (see below, n. 224); MS London Or. 6712, copied during the years 1287-1288, and MS Cambridge Add. 173, from 1289. For full details on these manuscripts and other manuscripts copied for him see Manuscrits médiévaux, II, 13. What these manuscripts have in common is their copyist's use of fixed blessing formulas – one for the living and one for the deceased – in acronym form. At least one of these formulas, as well as the combination of both, are particular to this individual copyist. In MS Paris, MS Parma, and MS Cambridge, the obscure acronym ישל״ם accompanies the name of the copyist Menaḥem. In MS Parma and in MS Cambridge, written after the passing of Menaḥem's father, the father's name is accompanied by the formula לעיי״ץ (already deciphered by Zunz as לזכר עולם יהיה צדיק [Psalms 112:6]; cf. Manuscrits médiévaux II, 13, n. 5). In all four manuscripts the two formulas were combined together in an acronym of the copyist's full name מנחם ישל״ם בן בנימין לעיי״ץ, i.e. מ״י בב״ל. In MS Toledo, Cathedral Z-86-25, which date of copying is unclear (See Manuscrits médiévaux, ibid.), the formula ישל״ם is included in the copyist's documentation of the date of a son's birth, as was customary in Italy: סימן יפה ליצחק יזיי״י ביר׳ מנחם ישל״ם. The obscure blessing formula for the living ישל״ם is unique and is known only from Menaḥem ben Binyamin's use of it, and in any case no other formulas resembling it can be found in any of the thousands of extant colophons. While indeed the blessing formula for the deceased לעיי״ץ was not unique to Menaḥem ben Binyamin, its use among Italian copyists was very scarce, and no copyist ever used it before him. It therefore stands to reason that it was the copyist Menaḥem who coined this blessing formula and appended it to his father's name, just as he coined the term ישל״ם and appended it to his own name in interlinked combinations that became standard elements of his full name and personal identifiers. For a more detailed discussion see M. Beit-Arié, 'The Identity of the Kabbalist Menaḥem Recanati,' Tarbiz, 67 (1998), pp. 573-577 (in Hebrew).

64 On the manuscripts copied by this skilled and learned scribe, the first of the female scribes known to us, see above, n. 11. In the colophons of MS Breslau-Prague-Wrocław, inscribed in Rome in 1288, and of the monumental MS Oxford, which she completed in 1293 for her relative Menaḥem ben Binyamin ר׳ מנחם ביר׳ בנימן הצדיק לעיי״ץ (no doubt, the abovementioned copyist, who, as stated, consistently employed the blessing formula for the deceased that he attached to his father's name only, and that was hence adopted by Paula), we find once more the use of a unique blessing formula in conjunction with her grandfather's name: פולה בת ר׳ אברהם הסופר ביר׳ יואב ציי״ע. It may be that Paula coined the blessing formula for the deceased or that the use of the formula ציי״ע was customary in her family (presumably an acronym for the verse וצדיק יסוד עולם [Habakkuk 2:4], without the initial conjunctive waw at the beginning). She employed it not only in these two manuscripts but presumably also in the manuscript kept by the Jewish community in Verona: it is safe to assume that Berliner (see above, n. 11) erred slightly in his reading of the blessing formula for her paternal grandfather Yoav (יואב) and wrote זיי״ע instead of ציי״ע. (זיי״ע is a late formula which stands for זכותו יגן עלינו ; See S. Ashkenazi & D. Jarden, Thesaurus of Hebrew Abbreviations, Jerusalem 1969 [in Hebrew], entry זיי״ע).

Generally speaking, the great variety of blessings for the living and for the deceased which were in use in Italy is remarkable. An instructive example of the variations in the blessing formulas can be seen in the colophon of a manuscript that Menaḥem ben Shabbetai copied for himself in 1423 in Montepulciano in central Italy. The copyist noted the names of his forefathers in a line going seven generations back and added two different blessing formulas for the living - for himself and his father, and five different blessing formulas for the deceased - for his forefathers: תם ונשלם על ידי מנחם יזיי״י בכמ״ר שבתי ישר״יו בכמ״ר יחיאל זצ״ל בכ״ר משה ריבלו הרופא זלה״ה בכ״ר שלמה ע״ה בכ״ר שמואל גליקו תנצב״ה בכ״ר יחיאל מב״ע.[65]

Honorifics

Apart from the blessing formulas following the names of the copyists (and of course, of authors), many scribes would use a variety of honorific titles to preface the names of their fathers and the name of the person who commissioned the copy. Most of them were given in abbreviated or acronym form, some in flowery turns of phrase, and they too tend to display regional usage, especially in Italy. Many of the honorifics preceding the names are stylized phrases common in a specific area, such as היקר ('the honoured') - the most common title in colophons across all zones, most conspicuously in the Orient and in the zone of Sefardic book culture; החכם ('the sage') – which was widespread in all zones since the very early manuscripts, especially in Spain, but rarely in Ashkenaz; הנכבד ('the respectable') - also common from the very early period in the Orient, spreading throughout all zones except for Ashkenaz, where it was seldom used; המשכיל ('the learned') - from the eleventh century a standard title in all zones, especially in the Orient, yet undocumented in Ashkenaz. Many other titles appear to a lesser extent in all of the regions but Ashkenaz, e.g. הנבון ('the wise'); מרנא ורבנא ('our teacher and rabbi', in Aramaic); הפרח (הטוב/נעים) הנעלה, הנחמד, etc. Copyists frequently combined several such honorific titles, and - in the Orient and Spain - even extravagantly so. See for example, the colophon of an entire Bible that was copied in Toledo in 1276/7 by the son of a famed scribe:

אני חיים בר׳ ישראל הסופר ני״ע בן ישראל כתבתי אלו ארבעה ועשרים ספרים בעזרת יוצר היצורים במאמר היקר הנכבד השם הטוב הנחמד נטע שעשועים מובחר בין רעים ר׳ יצחק הלוי בן כבוד השר הגדול המעוז המגדול רב בישראל ופרשיו ומבחר זקניו וישישיו נשיא

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65 Manuscrits médiévaux, II, 63.

נשיאי הלוים ר׳ שמואל הלוי מש׳ בכ׳ בן אללוי, והפרחים הנדיבים הנעימים והנאהבים
משרתי אלהינו המקודשים כלם אנשים ר׳ שמואל ור׳ יוסף ור׳ מאיר ישמ׳ צורם, שלשה בני
יצחק הלוי הנזכר מש׳ בכ׳ האיר האל רוחם לנדבה, וחזקו ידיהם לטובה, וצוו לעשות בהם
הנקוד והמסרה, ודקדוק וחקירה, כהוגן וכהלכה, ולגמור המלאכה. האל יזכם להגות בהם
ולקרות, משמרות משמרות עד סוף כל הדורות. ויקיים בהם מקרא שכתוב. ואני זאת בריתי
אותם אמר ה׳ רוחי אשר עליך ודברי אשר שמתי בפיך, לא ימושו מפיך ומפי זרעך ומפי זרע
זרעך אמר ה׳ מעתה ועד עולם. וכן יהי רצון ונאמר אמן. ונגמרה מלאכת עבדת הקדש. בשנת
חמשת אלפים ושלשים ושבע לבריאת עולם בטליטלה ישע יקרב.[66]

A later example of the heaping of flowery titles (some of which appeared in the previous
colophon) can be seen in a colophon of a Yemenite Pentateuch from 1478, copied by
one of the sons of another esteemed scribe—Benaya ben Sa'adia:

נכתבה זאת התורה אשר היא לעיני דורשיה מאירה וכשמש מזהירה על שם החבר הטוב
והנעים נטע שעשועים אביר הרועים אורי ומחמד עיני אלופי ומיודעי סעדיה ש״ץ בירב
ישועה זצ״ל בירב דוד רי״ת ה׳ יזכהו להגות בה ולדקדק בעניינה ולגלות מצפונה הוא וזרעו
וזרע זרעו מעתה ועד עולם ויקיים עליו מקרא שכת׳ לא ימוש ספר התי׳ הזי׳ מפי׳ והגי׳ בו יומ׳
ולילה ג׳ ויזכהו קוד׳ בר׳ הוי לראות זרע נכון דעגלא אמן נשלמה בחדש מרחשון שנת אתש״ץ
לישועה קרובה אמן והכותב הקל והנקל יוסף בן בניה ש״ץ בן סעדיה רי״ת ה׳ ימחול לי על
כל מה ששגיתי וטעיתי ונסתר מעיני כדכ׳ שגי׳ מי יבין וג׳[67]

However, our chief interest lies in the prevalent patterns of honorific titles, most of
which were inscribed as acronyms and formulaic abbreviations. When these titles refer
to previous generations, and indeed most of the honorifics were attributed to fathers,
the initial letter of the word בן precedes these acronyms. The most common title in all
zones during all periods was the abbreviation ר׳ in its reduced form (sometimes
appearing in its full form רבנו, רבי) or in conjunction with the letter ב, which represented
the word בן, affixed to it (ב״ר, בר׳, ביר׳, or בר without the dots indicating an acronym,
appearing like the word for 'son' in Aramaic – particularly in the Orient, and sometimes
בירבי, ברבי). These formulas appear in around half of the colophons. Moreover, the
distribution of the standard abbreviation ר׳ is even wider, since it is the basis for most
of the other formulas deriving from it. This can be seen in the titles characteristic of
(and some exclusive to) Italian colophons: the coinage common almost only to Italy
כמ״ר (בן כבוד מורי הרב ר׳) בכמה״ר -and, similar to it בכמ״ר / (כבוד מורי ר׳ (probably

66 MS Parma, Parm. 2668 (De-Rossi Catalogue, 782), fol. 383v.
67 MS Oxford MS. Opp. Add. 4° 97a (Neubauer Catalogue 1505), fol. 315v. On the Benaya family of
scribes, see below, n. 141.

מייר (בן כבוד אדוני מורי רבי), מייר (seldom used). Similarly, in the common acronyms that are not typical of Italy in particular, such as בכייר (בן כבוד רבי), found in around a quarter of the Byzantine colophons and in almost one fifth of the Italian colophons; as well as in a few colophons from Spain or by Spanish immigrants in the Orient הייר (הרב רבי) / בהייר. The same basis is used also for the acronyms typical of the Ashkenazic scribes: הנייר, the meaning of which is uncertain[68] בהנייר / and sometimes החייר, הנהייר[69] בהחייר / . The initial element in a concatenation of honorific phrases, which was quite prevalent in the Orient exclusively (including Yemen), sometimes appeared in acronym – כגייק (כבוד גדולת קדושת). The following are two examples of the formula (in its full form and in acronym form) from Islamic territories: one from the Orient and one from the Occident. The first colophon is from fragments of Tractate Keritut of the Babylonian Talmud, copied in North Africa in 1123:

הדרן עלך המביא אשם תלוי וסליקא מסכתא דכריתות בסייעתא דמרי שמיא. אדר א׳
ד׳תתפייג לעולם לכבוד גדולת קדושת הדרת יקרת צפירת עטרת תפארת כליל וכותרת מר׳
ור׳ נסים, תפארת עם עמוסים יברכהו מושיע חוסים, יגדלהו בכבוד בעושר ובנכסים,
יצליחהו בכל מעשים, יצילהו מיד שוסים, ימלטהו מכף נוגשים ושרי מסים, וצריו תחת
כפות רגליו יהיו מעוסים, וקמיו דרוכים רפושים רמוסים, בן כבוד גדולת קדושת הדרת
יקרת צפירת עטרת תפארת נזר וכותרת מרנא ורבנא סעדיה רוחו ונשמתו בעדן גן אלהים
יניח. אמן נייס, וכתב יוסף קטן הסופרים ביר׳ שמואל ביר׳ אפרים ניי׳ן מהר נפוסה.[70]

The second example is of two colophons appearing in the six-volume Hebrew translation of Maimonides' commentary on the Mishna, inscribed in 1223, precisely one hundred years after the writing of the previous colophon, undoubtedly in Fusṭāṭ, Egypt:[71]

נגמר סדר קדשים בעזרת שדי בירח כסליו שנת אתקלייה לשטרות וברוך העוזר ויש בו אחד
עשר מסכתות וזה הוא פירושן <...> וכתב שלמה הלוי בר כגייק הדרת יקרת צפירת תפארת
מרינו ורבינו שמואל הדיין המשכיל זכר צדיק וקדוש לברכה המקום ברחמיו הרבים
יסתירו בסתר כנפיו ויזכיהו לכל מדה טובה אמן נצח סלה וכן יהי רצון.

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68 Considering the popularity of the title הנדיב in Ashkenazic colophons, it can be assumed that the letter נ (nun) represents this word, while the ה (he) may merely be the definite article – הנדיב רבי.

69 This should perhaps be interpreted as החבר (a fairly common title in the Ashkenazic zone) = רבי, and as with the acronym הנייר, perhaps here too the definite article ה was added at the beginning.

70 MS Oxford MS. Heb. b.1, fols. 10–12 (See Codices hebraicis, Part III, Manuscrit 63, on additional fragments of this manuscript.)

71 MS Oxford MSS. Poc. 97, 233, 235–238 (Neubauer Catalogue 394-399). For references to the colophons see Neubauer & Beit-Arié Catalogue.

וכתב שלמה הלוי בר כבוד גדולת קדושת הדרת יקרת צפירת תפארת מרינו ורבינו שמואל
הדיין המשכיל זצ״ל המקום יסתירו בסתר כנפיו ויזכיהו לכל מדה טובה אמן נצח סלה וכן
יהי רצון.

Scribes' expressions of humility

As opposed to the use of honorific titles to exalt patrons who commissioned the
manuscripts, many copyists would attach to their own names derogatory titles in which
formulaic patterns may be discerned.[72] This practice is attested in approximately one-
sixth of the colophons. Although belittling attributes are found in all zones, their highest
relative frequency is seen in the Orient and especially in Yemen. This phenomenon was
more common in the Middle East and, moreover, scribes in those regions exaggerated
the expressions of humbleness and of self-deprecation more than elsewhere. By way of
contrast, Ashkenazic copyists would use such titles sparingly; moreover, they would
use a limited selection of brief attributes, especially הצעיר ('the young') – the
commonest formula employed in all regions, with differences in distribution; or הקטן
('the little'), which was similarly used to a lesser extent in all zones. A number of
formulas used in the Orient are unique and can tell us much about the origin of the
copyist. The title העבד ('the servant'), for example, whether used alone or as the initial
element in a chain of attributes, was prevalent almost exclusively in the Orient (except
Yemen) from the twelfth century onward. Sometimes the title העבד was followed by a
string of other titles: [73] הצעיר הדל הנבזה המסכן השפל הרזה, הצעיר העני החוטא הנמאס,
הנקלה[74] Often these clusters would end with another common Oriental coinage הנצרך
ספרא חלשא. The formula הקל, (or קל הקלים), as well as the formula לרחמי צורו/יוצרו
ומסכינא, are unique to Yemen.[75] A formula typical of Byzantine copyists was תולעת
ולא איש.

More expressions of humility, some of them standard formulas, are as follows: הנאנח, הנאנק,
העלוב, צעירא (זעירא) דמן חברייא, עלוב הזמן, העלוב והנבלם, הדל באלפים, הצעיר וקט מקומץ,
הצעיר בשואבי המים.[76]

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72 Steinschneider provides a number of examples, Steinschneider, Vorlesungen, p. 42.
73 MS St. Petersburg Евр.-Араб. 1344, copied in Cairo (אלקאהרה) in 1289.
74 MS St. Petersburg Евр.-Араб. 1817, from 1452.
75 The renowned scribe Benaya ben Saʿadya combined the two formulas in the colophon of MS Oxford
MS. Opp. Add. 4° 97 (Neubauer Catalogue 2328), which he inscribed in Sanʿa in 1461: חלשא ומסכינא
קטן הסופרים ועפר תחת רגלי המבינים קל הקלים ודל שבדלים.
76 MS Roma, Vittorio Emanuele, Or. 76, copied in Italy in 1454.

Worms Maḥzor. MS Jerusalem, Heb. 4⁰ 781/1, fol. 95r. <Würzburg? Germany>, 1272
The scribe within the illustration to the initial word וסופריי (my scribes) inscribed the name of his father
יהודה הסופר מנורנברק (Yehuda the Scribe from Nuremberg), his own name שמחה, and an additional name,
שמעיה הצרפ<תי?> (Shemaʻya the French (?), possibly the artist who illuminated the prayerbook

Appendix: A scribal stratagem for disclosing the copyist's name by the copied text and multi-handed manuscripts

When a Hebrew manuscript ends with no colophon, or when the colophon has been lost, it is often possible to identify with a fair degree of certainty the scribe's first name (and sometimes even his father's name and designation) by means of a stratagem commonly used by copyists and Masoretes. When examining an uncolophoned manuscript one should be aware of this habit and sufficiently alert to observe it[77] as specific characters or words would sometimes be marked, decorated or highlighted in the manuscript in ways which will be detailed below, with the purpose of indicating the scribe's name. This phenomenon seems to have been unique to Hebrew scribes and possibly bears some resemblance to the practices of colophon writing in Samaritan manuscripts of the Pentateuch.[78] Identifying this widely shared scribal practice provides us with an efficient tool for identifying the copyist's hand in an uncolophoned manuscript and assists us in differentiating the various hands involved simultaneously in the copying of one book, and which, moreover, might have used different examplars of the same text. This practice was already noted by the forefather of Hebrew bibliography and codicology, Moritz Steinschneider;[79] yet, in truth, it had been alluded to some seven hundred years earlier in the reprimand expressed by the author of *Sefer Ḥasidim*, and otherwise discussed by others before Steinschneider. *Sefer Ḥasidim* critically rejected the practice, a fact that probably attests to its prevalence among Ashkenazic copyists at the turn of the thirteenth century:

יש שכותבין ספרים את שמם[80] וכותבין בראשי תיבות את שמם פעמים מכוונים, או פירושים
יהפכו או תיבות יחסרו את שמם שירמזו בשביל וכי .וחוטאים[81] נאמר זה ועל <?> תיבות

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77 Much of this appendix is included in my article, M. Beit-Arié, 'How Scribes Disclosed their Names in Hebrew Manuscripts', in Omnia in Eo: Studies on Jewish Books and Libraries in Honor of Adri Offenberg Celebrating the 125th Anniversary of the Bibliotheca Rosenthaliana in Amsterdam, ed. I. Zwiep et al., Louvain 2006 (special issue Studia Rosenthaliana, 38/39), pp. 144–157.

78 Samaritan scribes marked the colophon by means of an acrostic of many words from the body text of the Samaritan Pentateuch, usually in the first chapter of Deuteronomy. See Gottheil, 'The Dating of their Manuscripts by the Samaritans', JBL, 25 (1906), p. 33.

79 Steinschneider, Vorlesungen, p. 45. I discussed this phenomenon briefly in a number of former publications; see especially, Beit-Arié, 'Ideals Versus Reality', pp. 562-563.

80 In the parlance of Sefer Ḥasidim the term ספרים, unqualified, usually refers to biblical books.

81 יהפכו means 'change the order of the words'. Although biblical books are mentioned, it is unlikely that scribes copying biblical books omitted or changed the order of words in order to indicate their names.

ושם רשעים ירקב <משלי י:ז>, שמם מחית לעולם ועד <תה׳ ט:1>. כדי שידעו מי כתבו
הוא עושה.[82]

In Spain, a similar prohibition was included in *Sefer haYir'a*, a work by Rabbi Yona
Gerondi (1200-1263), who had studied in yeshivas in France and had been influenced
by the ethical teachings of the Ashkenazic Pietists:[83] אם אתה סופר אל תחסר ואל תייתר
אות או תיבה לחתום שמך בראש שיטה.[84]

Indeed, the author of *Sefer Ḥasidim* (as does Yona Gerondi) condemns a stratagem
which was highly prevalent among Hebrew copyists in nearly all the geocultural zones
of medieval Jewry, not only in the Rhineland.[85] He refers to the scribes' practice of
highlighting the letters of their names when occurring at the beginning of lines in the

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82 Sefer Ḥasidim, section 706 = Sefer Ḥasidim , MS Parma, p. 136. The citation is taken directly from
the manuscript. In the Wistinetzki edition, instead of עושה, the last word erroneously reads נעשה. In the
Bologna edition, 1538, section 136 (fol. 19v) a similar condemnation is added: שם רשעים ירקב׳ – אלו
הסופרים המוסיפים תיבות או מחסרים תיבות ומכונים לרמוז שמם בראשי שיטות וכי בשביל שמם הנמאס יחסרו
תיבות או יוסיפו או יהפכו וכו׳. Carlo Bernheimer, (Bernheimer, Paleografia Ebraica), who cites this source
on p. 386, indicates only two examples of the occurrence of this scribal custom (p. 152, n. 1).
83 Cf. I. Ta-Shma, 'Rabbi Yona Ghirondi - German pietism in Spain', in Exile and Diaspora: Studies
Presented to Prof. Haim Beinart, Jerusalem 1988, pp. 165-194 (in Hebrew).
84 According to the version of MS Oxford MS. Opp. 340 (Neubauer Catalogue 875), an Ashkenazic
manuscript from 1298/9 fol. 130r; in MS Parma Parm. 1940 (De-Rossi Catalogue 1440), an Ashkenazic
manuscript from 1297/8, the text reads אם אתה שכיר סופר וגו׳. In this manuscript, like MS Oxford MS.
Mich. 569 (Neubauer Catalogue 1098), and a German manuscript from circa 1288/9 (See Neubauer &
Beit-Arié Catalogue, for this entry) the text reads כדי לחתום; a similar version, derived undoubtedly from
Sefer haYir'a, appears in Sefer haPli'a, cf. Torat haqana: Sefer haPli'a, Jerusalem 1997, p. 147a (I am
grateful to my friend the late Joshua Mundschein who brought this source to my attention). Ya'aqov
Reifman, who cited both these locations, based on other sources, in his book Arba'a ḥorashim (Prague
1860, pp. 10-11) and surmised that the text in Sefer haYir'a was the source for Sefer Ḥasidim, argued
that these passages refer to the acrostics of liturgical poets (paytanim) and not to scribal practices, but
Moritz Güdemann already observed correctly, as the text plainly states, that they refer to scribes. See M.
Güdemann, Geschichte des Erziehungswesens und der Cultur der abenländischen Juden während des
Mittelalters und der neueren Zeit, vol. 1, Wien 1880, p. 193. And yet, in 1891 Wistenetzki still wondered,
in the edition of Sefer Ḥasidim (see above, at the beginning of n. 82), whether the book was referring to
the practices of paytanim.
85 On its widespread use in manuscripts produced during and around the period of Ashkenazic Pietism
in Germany and northern France, see Beit-Arié, 'Ideals Versus Reality'. In this article I attempted to
gauge the social influence of Ashkenazic Pietism by confronting the instructions, guidance and
prohibitions regarding scribal copying practices with actual extant manuscripts from the regions where
the movement operated and made an impact. This investigation, which juxtaposed elusive textual
evidences which were subject to many different and contradictory interpretations, with authentic
'archeological' artefacts of that time, showed that all the scribal practices that were condemned and
prohibited by Sefer Ḥasidim continued to prevail in these manuscripts. This codicological inquiry may
be a modest yet significant and measurable contribution to the fundamental and ongoing debate about
the nature of this movement: did it provide an outlet for the radical desires of a small elite whose degree
of influence was quite limited, or was it a popular movement that appealed to the public at large, which
embraced and received it, allowing it to shape its social reality?

copied text (not necessarily in sequence)[86] by means of a simple ornament; in most cases three dots or more would be marked above the letter, with a slant toward the margins, as in the figure from MS Oxford Can. Or. 89, fol. 100v, copied by Paula *bat* Avraham.[87]

No doubt, the scribe's desire to highlight or disclose his name in this way could have affected the layout of the text he was copying, as can be clearly seen in many manuscripts, and it could even have tempted him to deviate from strict adherence to his model - as argued by the author of *Sefer Ḥasidim*, who must have severely condemned the custom not only out of concern that the text be corrupted but also because of his anti-individualistic tendency.

However, *Sefer Ḥasidim* alludes to only one variation of this scribal device, whilst in reality two were commonly used. The other variation, much more frequent and more easily implemented was the decoration of a word which spelling was identical to that of the copyist's name whenever it appeared in the text, especially at the two edges of the line and more often at the beginning of the line.[88]
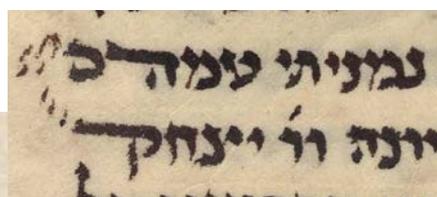
Highlighting a name was sometimes performed in a simple and modest manner, as was done with acrostics, yet sometimes it was executed boldly and garishly, with complex ornamentation[89] and decorations. Allegedly, using this stratagem involved no special manipulation of the copying, however the numerous occurrences of the copyist's name at the head of lines in manuscripts (in Ashkenaz especially)
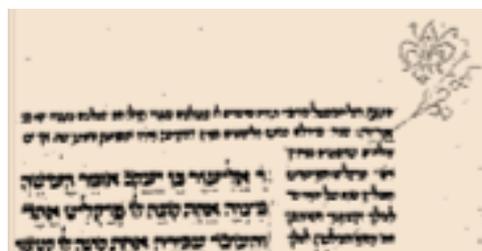
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86 Cf. Beit-Arié, 'Ideals Versus Reality', plate 7.

87 Ibid, plates 5-7. See also Manuscrits médiévaux, Plates, II, 48, 69 (scribe 1 and scribe 2); III. 2a, 23b, 68b. On Paula's copyings, see above n. 11, and in the part of the passage the note is in reference to.

88 Beit-Arié, 'Ideals Versus Reality', plates 8-10. And see Manuscrits médiévaux, Plates, Part I, (scribe 2) 62, 84, 134; II, 46a (scribe 1); III. 16 and see also I, 133. For a selection of plates of manuscript pages in which both styles of highlighting exist, see M. Beit-Arié, Meqorot le-qodiqologia u-paleografia 'ivrit, ed. T. Leiter (mimeographed), Jerusalem 1994, pp. 129, 137-143, 145, 185, 188, 189.

89 See e.g. Beit-Arié, 'Ideals Versus Reality', plate 8. This plate shows a page of a biblical text copied by Eliya ben Berachia the vocalizer in 1239 in France, where the scribe used complex ornamentation to highlight his name in the four places in which it occurred (three at the end of a column, and one at the top).

suggest that the copyists were likely to crowd together or space out the text, or alter the word order, perhaps even delete or add words for achieving this – a hypothesis which, of course, can be tested.

The practice described above was extremely common in all zones apart from the Middle East, and was implemented without limitations in all the copied texts. Biblical codices too did not escape this scribal intervention. It was so firmly established that one can find it even in the early printed books from Prague, which – having been printed on parchment and decorated by hand - reflect the transition from manual bookcraft to mechanical production as well as the combination of the two forms in early printing.[90] In a prayer-book printed there in 1515/6 on fol. [55]r (in a copy formerly kept at the London Beth Din, and currently in a private collection) and in 1518/9 on fol. [54]r (in a copy kept in the National Library of Israel)[91] the word ומאיר occurring at the beginning of a line was highlighted by two pairs of dots above the word, no doubt indicating the name of the printer Meir ben David מכתי״ם.[92]

The highlighting of names – whether by pointing out acrostics at the beginning of lines or by singling out an identical word or name – can be discerned in a quarter of the extant dated and colophoned manuscripts from all zones. The rate of use of such practices is not uniform across the geo-cultural zones. Indeed, it is much more common in manuscripts produced in the zones of Ashkenazic book culture (the German lands and its neighbouring regions, and northern France), where it occurs in half of the dated manuscripts until 1500. It appears in one third of the very many dated manuscripts inscribed in Italy, some of which were copied by immigrant scribes from Ashkenaz, Spain, and Provence. Manuscripts produced in the Byzantine zone reveal a proportion similar to the general average (26%). In the zones of Sefardic book culture, the use of the stratagem in dated manuscripts was quite limited, reaching no more than 17%. The practice of highlighting names had not been widespread in the Middle East: in Yemen

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90 Cf. M. Beit-Arié, 'The Relationship between Early Hebrew Printing and Handwritten Books: Attachment or Detachment', Scripta Hierosolymitana, 29 (1989), pp. 1–26. Reprinted with corrigenda in Beit-Arié, Makings, pp. 251-277.

91 Its call mark in the National Library of Israel in Jerusalem is R 8° 91A517 (until recently held in the Schocken Library). The same occurs in a copy which printing date is unclear (maybe a slightly different variant of the 1518/9 edition), kept by the Jerusalem Italian Jews Association.

92 An acronym for: מאיר כותב תפילין מזוזות (Me'ir writer of phylacteries and mezuzas), which demonstrates that many of the early printers and typesetters were former scribes.

it was never in use, while in other areas of the Orient it appears in only 4% of the extant dated manuscripts, most of them late (from the fifteenth century), and some copied by immigrant scribes. Thus, the highlighting of the name was adopted only to a small extent in Muslim territories: in their East it not used at all while in their West its diffusion was limited.

The chronological distribution of this practice was not uniform, of course, neither globally nor in each of the zones. However, it is interesting that despite the differences in its rate of occurrence reaches a peak in the fourteenth century in all the regions in which it is present: 63% of all the documented dated manuscripts from Ashkenaz, 37% of the same from Italy, 38% from Byzantium, 27% from the zones of Sefardic book culture. In the fifteenth century, the period in which Hebrew bookcraft and design achieved their most consolidated form and from which the largest number of dated manuscripts have survived (reaching some 50% of all dated manuscripts until 1540), the use of the highlighting stratagem actually declines, down to 13% in the Sefardic regions, 29% in Byzantium, and 43% in Ashkenaz.

The earliest documentations of the scribal practice of highlighting one's name are from the zones of France and Germany, where, as noted, it was more prevalent than elsewhere. The oldest dated manuscript where characters that form a name were pointed up is the dated portion of the famous Florence codex of the Babylonian Talmud (MS Firenze, Bib. Nazionale, Magl. II-I-7) completed in 1177, being the first and foremost extant dated manuscript from the regions of Germany and France, although the originality of the highlighting in this manuscript is questionable.[93] This said, this manuscript was antedated by an uncolophoned Ashkenazic manuscript produced, no doubt, in France: that manuscript. now in Avigdor Klagsbald's collection and formerly MS Sassoon 535,[94] contains the *Vitry Maḥzor* with decorations of the name גמליאל

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93 On p. 148, the characters of the name יצחק were highlighted in the following manner: the first character was pointed up with dots in a word at the end of a line, the second character – in a word at the beginning of the following line, and the two last characters were pointed up when they occurred in the middle of another two lines. David Rosenthal had noticed these markings but had reservations as to whether they were meant to highlight the scribe's name; see his introduction to the facsimile edition of the Babylonian Talmud, MS Firenze, Bib. Nazionale II 9-7, Jerusalem 1972 (Vol. 1, p. 4, and n. 27). Indeed, it is quite obvious that these dots were not added by the copyist: the highlighting style is uncommon, certainly for such an early period in time; the copyist could have highlighted his name in an earlier occurrence in the text but avoided doing so; and it is also unlikely that he would have chosen to indicate his name in an unappealing passage from Tractate Bekhorot (B. Bekhorot 29b), cf. Codices hebraicis, Part IV, Manuscrit 79.

94 Ohel David Catalogue, pp. 305-313.

occurring in several places.[95] The oldest dated Ashkenazic manuscript which comprises an indication of locality as well as the above mentioned highlighting device is MS Vatican, Vat. ebr. 468, a biblical manuscript copied in La Rochelle in 1215.[96]

In Sefardic zones the device first appears as an acrostic-like pointing up of the first characters in a series of lines in Yehuda ibn Tibbon's translation of Yona ibn Janaḥ's *Sefer ha-shorashim*, copied in 1241.[97] Among the dated Italian manuscripts, of which only a few that were produced before mid-thirteenth century have survived, the use of the device can be clearly discerned in the hand of the one of the copyists who participated in the production of a manuscript in 1266 in Salerno in southern Italy.[98] The earliest extant documentation of this practice in the Byzantine zone comes from a manuscript of Rashi's commentary to the Prophets, from 1298, one of the earliest dated

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95 On pp. 9, 274 (twice), 291, 501. Undoubtedly, this manuscript predates MS Firenze. It was copied in the second quarter of the 12th century, between 1123/4 and 1154/5; see S. Stern and J. Isserles, 'The Astrological and Calendar Section of the Earliest Maḥzor Vitry Manuscript (MS ex-Sassoon 535)', Aleph, 15 (2015) pp. 199-318, especially pp. 207-208. Its codicological features, in particular the parchment on which it was copied, attest to this dating. In another manuscript of the Vitry Maḥzor, MS Parma Parm. 2574 (De-Rossi Catalogue 159, Richler & Beit-Arie Catalogue 1053), whose codicological profile suggests an early date although its inclusion of Sefardic piyyutim rules out a date prior to the second decade of the 13th century (Prof. Yonah Frankel, personal communication), the name Yitsḥaq is highlighted several times, and the characters of the acrostic Yitsḥaq ben Netan'el (יצחק בן נתנאל חזק [fol. 37r]) were pointed up once. Many highlights of the name Shemu'el occur in the copying of one of the undated Ashkenazic manuscripts which seems to have been copied in the second half of the 12th century – MS Oxford MS. Laud. Or. 328 (Neubauer Catalogue 179, and see also Neubauer & Beit-Arié Catalogue, in the entry for this manuscript).

96 This is the first manuscript that clearly proves that the highlighted name is indeed the copyist's name, since in all earlier dated manuscripts employing this practice the copyist had been anonymous, see below. The same scribe copied another biblical manuscript commissioned by a different patron: MS Vatican Vat. ebr. 482. This manuscript lacks a date in its colophon, which itself is incomplete. Here too the copyist highlighted his name when it occurred in the biblical text.

97 MS Vatican Vat. ebr. 54. fol. 11v displays a highlighted acrostic of משה. The name of the copyist was erased from the colophon.

98 MS Parma Parm. 2750 (De-Rossi Catalogue 422). In MS Paris Hébreu 163, copied in Italy a short time before, in 1253, the characters of the scribe's name (explicitly mentioned in the colophon) were highlighted in the opening and ending verses he composed and placed between the different works (cf. Manuscrits médiévaux, II, 8). In our discussion we did not take acrostics of this type into account, all the more so because the markings of the acrostic in this manuscript are not positioned at the beginning of verses but rather at the beginnings of words, and sometimes even in their middle part. Therefore it might make sense to likewise ignore a similar phenomenon in the earliest dated Italian (and European) manuscript, MS Vat. ebr. 31, from 1072/3, in which the copyist's name was not mentioned in the colophon inscribed at the end of this codex. In his catalogue, Moshe David Cassuto hypothesized that his name was משה, as he noticed that the letters mem (מ), shin (ש) and he (ה) were marked by the copyist as an acrostic in the first words of the opening rhymed verses at the beginning of each of the copied works and in the ending verse of the final work. See Codices hebraicis, Part II, Manuscrit 38. On the other hand, perhaps one should consider even the acrostics of the opening or ending verses composed by copyists as a means of disclosing their names. In this case the copyists did not use the copied text for their purpose.

manuscripts that survived from this region.[99] Fragments from Deuteronomy, copied by the scribe Tuvia ben Avraham of Greece in 1196,[100] apparently in the Orient or in North Africa, cannot provide evidence of an earlier documentation, as the allusion to the scribe's name by pointing up its characters appears not in the body of the text, but in the colophons of the scribe and the vocalizer (who also בדק, i.e. proofread, the copying), as was widely practiced in Byzantium both by rabbinic and Karaite copyists.

The rare evidence for the use of this practice in Oriental manuscripts is perplexing. Most of its rare occurrences appear in the late Middle Ages, apparently as an influence of Sefardic immigrants, yet the fact that it is found already in three relatively early uncolophoned manuscripts is instructive. One of these,[101] copied apparently at the end of the twelfth or beginning of the thirteenth century, clearly shows that the device was known in the East: the anonymous copyist marked the name משה thirty times, when it appeared at the beginnings of lines![102] These early manifestations seem to indicate that the stratagem was already known in the Orient as it began to spread throughout Europe, though, for some reason, it did not take firm hold. Before its few occurrences in the fifteenth century it was evidenced in dated manuscripts from 1314 (two manuscripts copied by the same Byzantine hand) and from 1343, and in a group of manuscripts copied in the late fourteenth century (1382 and 1388) apparently in Jerusalem, by three Sefardic copyists and an Ashkenazic copyist whocollaborated with one of them.

The destination of the copy did not affect the use of the highlighting practice: it was not confined to copying of scholars and literati copying for their own use, and even the commissioned scribe would not hesitate to point up his name. Indeed, of all the manuscripts in which the device is observed, the number of manuscripts produced by commissioned or casual scribes is not inferior to that of user-produced manuscripts;

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99 MS Cambridge Add. 1733, fol. 46r (highlighted in acrostic form). In respect to its date, it should be noted that the weekday mentioned in the colophon is discordant with the day in the month that was inscribed.

100 MS St. Petersburg, Евр. II B 1532.

101 A manuscript of Midrash Tanḥuma, formerly kept in the Sassoon collection 597, and now in the collection of the Segre-Amar family of Torino.

102 In the other manuscript, MS Oxford MS. Poc. 239 (Neubauer Catalogue 858, cf. Neubauer & Beit-Arié Catalogue, in the entry for this manuscript), also undated, the scribe who copied the ending (and ossibly the beginning as well) of Maimonides' Sefer ha-mitsvot in Arabic, highlighted his name. This manuscript was copied before 1276/7, the year in which it was proofed, but may have been copied already during the lifetime of Maimonides, who is mentioned in the colophon with a blessing for the living.

quite the contrary, its manifestation in them is much higher in all areas excepting Byzantium.

How do we know that the highlighted or decorated names in copied texts were indeed the names of the copyists and those of other collaborators in the production of the book – vocalizers or Masoretes - or the patrons for whom the manuscripts were produced, and perhaps even the names of later owners and users? This question can be investigated quantitatively based on all the manuscripts that attest to the use of the highlighting practice and in which the copyists or owners are explicitly named in the colophons. The examination of this corpus, comprising 1392 manuscripts, of which 601 are dated and the rest (791) are undated colophoned manuscripts with indications of the copyist's name or whose copyists were identified on the basis of other dated manuscripts, reveals that most of the singled-out names were the copyists'.[103]

In forty five dated and undated biblical manuscripts, mostly from Ashkenaz, we encounter highlighted names only within the Masora Magna. Clearly, these markings were intended to communicate the name of the vocalizer-Masorete, even when not mentioned in the colophon.[104] The singling-out of patrons' names (found in some two

103 These figures include manuscripts where names other than that of the copyist were also highlighted. 104 In MS Berlin Ms. Ham. 80, which holds two volumes, two biblical manuscripts were coupled erroneously: MS Berlin Ms. Ham 80 (1) contains an uncolophoned Ashkenazic copy of the Pentateuch, Five Scrolls, and Haftarot and was undoubtedly copied at the end of the 13th century, and MS Berlin Ms. Ham. 80 (2), which includes Isaiah, Latter Prophets and Hagiographa, copied in Ashkenaz in a different script in 1289/90 for Avraham ben Natan - see above, before the reference to n. 20. In fol. 25r the name יעקב was decorated 7 times: 6 when it occurred in the first line of the upper margin Masora and once when it occurred in the lower margin.
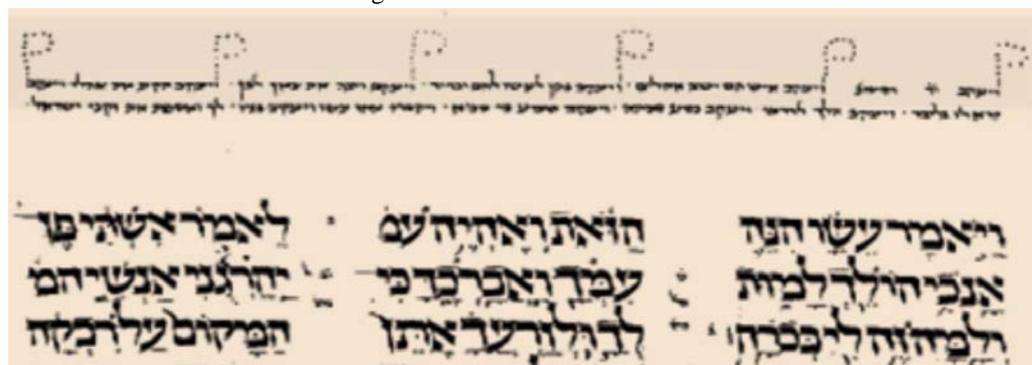
The custom of highlighting the name of the vocalizer-Masorete in the Masora is evidenced almost exclusively in Ashkenaz. The examples below were found in undated manuscripts. The name אברהם, for example, was highlighted a number of times in the Masora in the margins of an Ashkenazic Bible from the second half of the 13th century, copied by the scribe יצחק, who decorated his name a few times in the text (MS Vatican Vat. ebr. 3, fols. 10v, 17r, 37v; on fol. 236r the scribe highlighted the word קרא). Similarly, the name שמשון was highlighted four times in the Masora of a 13th-century Ashkenazic

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dozen manuscripts) as well as that of other names, does not diminish the uniqueness of the Hebrew copyists' practice of singling out up their own names, since in most cases the copyist would single out his own name as well.[105] It is possible that some of the highlighted names which appear in single-handed copies and are not the copyist's name, were not allusions to names but are rather blessing formulas.[106] Very few colophoned

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manuscript containing the Pentateuch with Onkelos Aramaic translation, the Five Scrolls, and Haftarot (MS Vatican Urb. ebr. 3, copied by the Hayyim, who decorated out his name in the body of the text). A unique example from outside of Ashkenaz is witnessed in a copy of Former Prophets produced in Spain in the 14th century: in the body of the text the name יעקב was highlighted, and so was the name יהודה in the Masora; see MS Parma Parm. 1889, 1891 (De-Rossi Catalogue 827), in two volumes: the name of the scribe appears on fol. 60r of the first volume and on fol. 150r of the second volume; the name of the Masorete appears on fol. 80v of the first volume.

105 This pertains to manuscripts in which the name of the patron, as mentioned in the colophon alongside with the copyist's name, was highlighted in the text. The earliest example of the kind derives from Ashkenaz in 1289/90: in a manuscript of Maḥberet Menaḥem and Qitsur he'Arukh, copied by three scribes, the third scribe, Asher ben Ya'aqov HaLevi, noted that it had been copied for his cousin Yitsḥaq ben Eleazar HaLevi. This copyist highlighted in his share of the copying the name of the owner יצחק (MS Bern, BB 200, fol. 250r). In a manuscript of Sefer Mitsvot Qatan copied in 1373 in Italy by Elia ben Yehuda for Shelomo ben Elia of Rimini, the scribe highlighted his name twice in the copied text in the form of an acrostic at the beginning of lines and highlighted the name of the owner once, using the same technique (MS Cincinnati, HUC 152, fols. 53v אליא 113v אליה and 80v שלמה). Out of the few occurrences of highligting the patron's name we find one instance of a more elaborate highlighting in the Orient, where this practice was in fact very rare. This example illustrates even more clearly how the device could be used in acrostic form not only to indicate a first name (both Hebrew and non-Hebrew), but also the full name of the patron who commissioned the copy. In MS Oxford MS. Hunt. 134 (Neubauer Catalogue 1008) six quires of the sermons of Rabbi David ben Joshua HaNagid were copied in an Oriental script. The manuscript has no colophon, but on a few pages the scribe took care not only to mark in acrostics at the beginning of lines his name and the name of the patron, but also to create in this way a brief colophon running over three pages, located in proximity to each other albeit non-consecutively: מוהוב<the Arabic name Muhub, meaning, given> הו נתן <'being the Hebrew name Natan'> כתב ליעקב <fol. 85r> בר <fol. 87r> יצחק <fol. 88v> ('wrote to Ya'aqov ben Yitsḥaq'). He repeatedly marked his names מוהוב (fols. 96r, 111v), אני נתן (101r) in acrostic form, and marked the name of the owner יעקוב five times. This allows us to easily identify the copyist as נתן בן אברהם בן ישמעאל בן יהודה ידיע תיפא, who copied three volumes of the same work for his own use in 1477-1484 in Damascus (MS Strasbourg, BNU 4033-4035) and in 1488 copied, also in Damascus, another manuscript for his own use (MS Moscow, RSL Guenzburg Collection 1637).

106 This pertains to the highlighting of words such as חיים (e.g. in MS Cambridge, Trinity College, R. 15. 53, a copy of Maimonides' Mishne Tora copied in Ashkenaz in the first half of the 14th century, in which the name אליעזר was decorated several times in the text, yet on fol. 34v the word חיים was singled out); ברוך (e.g. in MS Paris Hébreu 316, copied in 1344, apparently in northern Italy by seven scribes, all of whom - with the exception of one - used an Ashkenazic script; there we find ברוך highlighted in the verse כי ברוך אני in the section of the manuscript copied by a scribe who highlighted the name דוד; see Manuscrits médiévaux, II, 22); שלום (in MS Parma Parm. 3158 [De-Rossi Catalogue 72], copied in Ashkenaz in 1380 by Menaḥem ben Ya'aqov for his own use [the late Mordecai Glatzer showed me this and other examples]) and יחיה (in MS Hamburg Cod. Hebr. 4, an uncolophoned Pentateuch and Five Scrolls with the Aramaic translation, copied in Ashkenaz in the 14th century, in which the name יהודה was decorated a number of times in the main scribe's share, whereas the secondary scribe, on p. 413, decorated the word יְחְיֶה – which we cannot assume indicated a name, but rather a blessing. Incidentally,

manuscripts in which names other than that of their producers were highlighted have survived. Among these, the dated ones derive from the fifteenth century. In a few cases the copyist's patronym was singled out. This in no way befogs the essence of the highlighting practice, since the patronym is a component of the copyist's own name (as described above in the section on 'components of names'); this is all the more true when the copyist's name was highlighted next to his father's.[107]
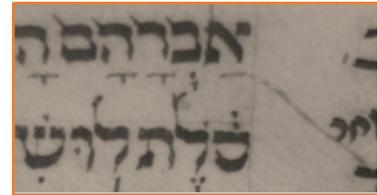
Nurit Pasternak observed a unique technique for intimating the vocalizer's name, achieved by means of a fine line suspended from the first vocalization sign of the vocalizer's name when it occured at the beginning of the line, or from the last vocalization sign when his name appeared at the end of the line. This practice was found in four manuscripts of Italian maḥzors and in one biblical manuscript, all copied in approximately the same years either in Florence or in the region of Emilia Romagna. In these four copies we see an identical singling-out of the name אברהם, who was doubtlessly the vocalizer of all three maḥzors and of the biblical text mentioned.[108]

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the Masorete-vocalizer highlighted the name שמשון three times there in the text of the Masora [pp. 6, 302, 483]).

107 There are few such examples, such as the manuscript of the Vitry Maḥzor, MS New York MS 8092 copied by Eli'ezer ben Shemu'el, presumably in France in 1204 (See A. Grossman, The Early Sages of Ashkenaz, Jerusalem 1988, p. 172, n. 180 [in Hebrew]), where the name אליעזר was often singled out, while the name שמואל (fol. 129r), the scribe's father, was highlighted once.

108 MS London Add. 19944-19945 (Margoliouth Catalogue 626-627) copied by Yitsḥaq ben 'Ovadia of Forlì in Florence in 1441; MS Jerusalem Heb. 8° 4450, copied by Leon <Yehuda> ben Yehoshua' of Cesena, without a date indication, and illustrated, apparently by Yo'el ben Shim'on (see below). In this manuscript the name אברהם was highlighted in this manner many times, e.g. on fols. 79v, 83v, 111v (twice). The same Leon copied also MS Hamburg, SUB Cod. Levy 26, in 1462 in Parma, and MS London Harley 8568 (Margoliouth Catalogue 629), in the years 1465-1466 in Reggio nell'Emilia. Another manuscript is MS Jerusalem Heb. 4o 1384, the scribe of which was recently identified as Yo'el ben Shim'on, the renowned Ashkenazic scribe and artist active from mid-15th century mainly in Italy (see Beit-Arié, Makings, pp. 93-107, 216-248). Shelomo Zucker, who identified the scribe who copied and decorated this manuscript, refuted the suggestion that the highlighting of the name Avraham, as Pasternak observed (in p. 120r and twice in p. 196v), was meant to disclose the identity of the vocalizer; yet his arguments are not convincing, mainly because of the occurrence of this unique highlighting of the same name in another three manuscripts produced during the same period in the same whereabouts (see S. Zucker, The Moskowitz Maḥzor of Joel ben Simeon, Jerusalem 2005, pp, 16-17; and see Pasternak, *Together and apart*, p. 235, n. 219). The biblical manuscript is MS Oxford MS. Can. Or. 62 (Neubauer Catalogue 26), copied in 1472 probably in Florence. It is a remarkable multi-layered codex with many types of scripts, containing a Pentateuch with Onkelos translation and Rashi's commentary in the margins, as well as the Five Scrolls with commentary in the margins, and Haftarot. The biblical text is inscribed in a square Italian script in the Ashkenazic style, the translation column is in a small square script in the Sefardic style, apparently by the same hand that copied the Rashi's commentary in a semi-

One can therefore determine that the vast majority of highlighted names in the thousands of medieval Hebrew manuscripts that lack any mention of the scribe's identity are the scribes' names, while only a small minority may allude to the name of others, as for instance the copyist's father or the patron who commissioned the manuscript. This small minority demands cautious identification.[109] This device for disclosing the scribe's is, of course, of tremendous codicological value, for it allows us to uncover the identity of unnamed scribes. Even though this practice usually exposes the first name of the scribe only, it still enables us to compare his hand, including all its para-scriptural components, to dated and localised copyings by scribes bearing the same name. Thus we should be able to fully identify the scribe. Moreover, when the names are uncommon, the comparative task becomes much simpler. However, the most complex application of this contrivance pertains to multi-handed manuscripts, which is of even greater importance to both palaeography and codicology.

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cursive script of the Sefardic type, while the commentaries in the margins of the Scrolls were inscribed in a typical semi-cursive Ashkenazic script. The biblical text was copied by the author of the colophon, who completed the copying of the Pentateuch in 1472, and copied another manuscript in Florence in 1490. The highlighting suspended from the vocalization marks occurs in the book of Genesis. This vocalizers' device is documented not only in Italy, as indicated by MS Parma Parm. 3251, which contains laments for the Ninth of Ab according to the Western Ashkenazic rite and was copied in the middle of the 14th century (apparently in מגנצא=Mainz, as indicated by the highlighting of this name when it occurs in the text; see Richler & Beit-Arié Catalogue [Parma], no. 1130): In addition to the highlighting of the name יהודה with a drawing of a head on fol. 64v (presumably disclosing the copyist's name), fol. 34r contains a conspicuous marking of the vocalization of the first letter of the name יעקב which occurs there at the beginning of the line.

109 The following are two examples of the complex and multi-faceted, yet not entirely clarified use of the highlighting artifice. MS Jerusalem, Israel Museum 180/94 (formerly MS Sassoon 506) – a Pentateuch (with Onkelos translation), Five Scrolls and Haftarot with Rashi's commentary, and a second copying of the Pentateuch in the lower margins of the first copying – was inscribed in Ashkenaz in 1344 by an anonymous scribe for Yosef ben Ephraim. In the core text one can discern the highlighting of the names נתנאל (4 times) and דניאל (once), as well as ornamentation in red ink of the name and patronym of the owner. Was the scribe's name Netan'el ben Dani'el? Furthermore, the Masorete-vocaliser, who also added the second copying of the Pentateuch in the lower margins, highlighted the name לוי many times in the Masora and in the re-copying (see Manuscrits médiévaux III, 101*). Is this a case in which the highlighting device was used in one manuscript for the patron's name and patronym, as well as for that of the Masorete-vocaliser and of the scribe himself and possibly his father? Yet another example, that raises further difficulties, can be found in a manuscript of the commentary on the She'iltot of Rav Aḥai by Yoḥanan ben Re'uven, copied by Menaḥem ben David in Byzantium for his own use in 1458 (MS Berlin Ms. Or. 8° 333, Steinschneider Catalogue 165). In this manuscript the copyist's name was highlighted both in the text and in acrostic form 26 times (!), yet it also contains the singling out of the names אליה (fol. 94v), יוחנן (fol. 143v), אליעזר (fol. 143v) and מזל טוב (fol. 268r, 271v, 272v, 275r). The highlighting of the name יוחנן could perhaps allude to the name of the author, though we have no similar example for this kind of use. The last name may be a blessing formula only.

As mentioned, almost nine percent of the dated medieval Hebrew manuscripts were copied by several scribes who collaborated with one another, and it may be that among the tens of thousands of undated manuscripts the proportion of multi-handed manuscripts is even larger. The number of scribes collaborating in such copying could range from two to seven. The ability to distinguish between the different hands that participated in the copying is crucial not only for their full codicological and palaeographical description and not only for informing us about the modes of production and distribution of books in the Jewish societies, but also for textual criticism. In such collective contexts scribes might have used different models,[110] and even if they all copied from one single source, each would have been affected by spelling habits, pronunciation traditions, mental associations, educational background and personal style during the complex process of the transmittal from the model to the copy – including its physiological, mental, visual, and phonetic components.[111] Distinguishing between hands is rendered difficult by the stereotypical nature of script types in each of the three modes (square, semi-cursive, and cursive) in each region. This difficulty is further aggravated by the casual fluctuations in the writing of each individual copyist. For this reason it is necessary to track the individual para-scriptural elements that accompany the writing in order to isolate each hand.[112]

The scribal device used for disclosing the copyist's name provides a useful aid when dealing with multi-handed copies, and when one is unsure whether a manuscript is homogeneous or multi-handed. Indeed, we do find a stronger tendency by scribes to employ this device in manuscripts that were multi-handed. No doubt, the highlighting of their names helps us in locating and isolating the various hands. Generally speaking, multi-handed colophoned manuscripts would have one colophon only, inscribed by one of the scribes and bearing no mentions of his collaborators, even if that scribe had copied only a minor part of the text. Such scribes would either be hired to copy the book - given their repute - assisted by their apprentices, though we possess no evidence of workshops or centres of copying; or they would be copyists initiating the production for their own use, possibly with the assistance of family members or students.

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110 See below, chapter 10, in the section on the 'homogeneous codex'.

111 See in detail below, chapter 13, in the section on 'Personal production and its impact on the transmission'.

112 See below, chapter 10, in the section on 'Distinguishing between hands that shared in the copying of the text in one codex'.

Most of the few instances in which the co-scribes were explicitly mentioned in the colophon appear in codices copied by members of one family. This is the case in Rashi's commentary on the Pentateuch, MS Parma, Parm. 2886 (De-Rossi Catalogue 333), copied in Italy in 1392 by two brothers, Natan and Avraham, sons of Avigdor, as stated in the colophon. Indeed, each of them singled out his own name in his segment of the copying.[113] The famous manuscript of two illuminated volumes of the compiled commentaries on the Bible by Rashi and other commentators, MS Munich, BSB Cod. Hebr. 5, was copied - according to its colophon - for Yosef ben Shelomo in 1232/3 by Shelomo ben Shemu'el of Würzburg, who did indeed decorate his name as it occurred in the text. The scribe Shelomo did not indicate in his colophon he had been assisted by another scribe, but one wonders whether the copying was indeed done single-handedly: the examination of the regular individual para-scriptural elements which accompany the stereotypical yet variegated script, such as the devices for keeping the left margin justified, the individual shape of the graphic fillers at the end of the lines, and the shaping of the tetragrammaton, clearly reveals that another hand, in a script
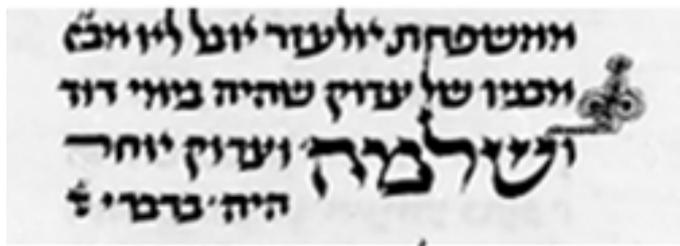
resembling that of the scribe Shelomo, participated in the copying. This hand had produced fifteen complete quires as well as another four shared with the main scribe. Indeed, within the segments copied by the secondary scribe the name שמואל was decorated and highlighted whenever it occurred at the beginning of a line, a total of sixteen times! Thus did this assisting scribe, a skilled copyist, whose calligraphic abilities did not fall short of those of the main scribe, compensate for the omission of his name and contribution from the colophon: he disclosed it covertly over and over again, in a subtle way which must have been widely recognized in his milieu. One can assume that the co-scribe would not have added a highlighting to his name without the consent of the main scribe, who indeed employed the same device. Since the phenomenon is common to many multi-handed manuscripts from the regions of

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113 אני אברהם תנוו"י בכאמ"ר אביגדור ישר"ו השלמתי זה הפירוש חומש לרבינו שלמה ע"ה מאור הגולה. ואמת כי התחיל לכותבו כמ"ר נתן אחי ע"ה ואני השלמתיו בשלישי בשבת בעשרה ימים לירח תמוז שנת חמשת אלפים ומאה וחמשים ושנים לבריאת עולם. השם שזיכני להשלימו הוא יזכיני להגות בו ובכל שאר ספרי הקודש אני וזרעי וזרע זרעי עד סוף כל הדורות. Natan, who had passed away, copied most of the commentary on fols. 1r-115r, and Avraham completed it in fols. 115r-156r.

For the division of copying between grandfather and grandson see Manuscrits datés, II, 69.

Ashkenaz, Italy, and Byzantium, this may have been customary among scribes who produced manuscripts jointly with other copyists: as a rule, the senior scribe – either a commissioned professional or one who initiated a copy for himself - would not mention he had been assisted by others, yet he would let his collaborators indicate their names by means of the text they copied.

MS New York, L 827 illustrates this phenomenon in manuscripts copied for one's own use. According to the colophon, the manuscript was copied in 1387 by Yehuda ben Namer of Manisa (Magnesia), Turkey, for himself, while in fact he copied its ending only (fols. 370r-392r)! The bulk of the text was copied by another scribe who revealed his identity by highlighting the acrostic משה (Moshe), the first incidence of which shows on the very first page of the manuscript.[114] One may infer that Yehuda ben Namer hired Moshe to copy Ibn Ezra's commentary on the Pentateuch, yet copied the last twenty three folios and inscribed the colophon in his own hand, only to boast of having copied the whole manuscript.

An instance from the year 1239 from Ashkenaz demonstrates how one can identify by means of this scribal device the identity of the scribe or scribes whose names were left unknown. The colophon of MS Cambridge, St. John College A 3, Rashi's commentary to the Prophets and Hagiographa does not mention the name of its scribe. The manuscript had obviously been copied by one hand that highlighted the name David five times. Yet the four quires of Psalms were inscribed in a different script and in a different layout, and, indeed, the name of Menaḥem was highlighted there wherever mentioned in the text (seven times). Evidently, the individuation of hands is substantiated by the highlighted names; furthermore, by means of this device scribes' names are revealed. Manuscripts that had been copied by two anonymous hands and contain highlighting of both names are a commonplace occurrence and do not require further exemplification. Nevertheless, instances of manuscripts produced by three or more hands are instructive, as the use of the singling out of their scribes' names facilitates the individuation of hands and even calls them to our attention. MS Berlin Or. Ms. 4° 361 (Steinschneider Catalogue 51) contains an Ashkenazic commentated maḥzor and Psalms with Rashi's commentary, copied around the middle of the fourteenth century by Binyamin the scribe, who indicated his name in an brief undated

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114 In fols. 1v, 15r, 32v, 38r (twice), 92v (twice), 200v. The scribe who copied only the end of the manuscript and inscribed the colophon decorated his name when it occurred in the last line on fol. 372v.

colophon. Binyamin had obviously copied a large portion of the maḥzor and its commentary (highlighting his name three times). However, it is clear that two more hands had copied significant portions of the manuscript: the first, which copied the commentary in the margins from fol. 131v until the end of the manuscript, singled out five times the name שמואל; and the second, which copied the core text from fol. 214r to fol. 333v, singled out four times the name יעקב.[115] Moreover, this manuscript also alludes to the names of the manuscript's patron and his son: in Binyamin's share of the copying – the only copyist who explicitly indicated his name in the colophon and who was undoubtedly the main scribe responsible for the manuscript production – Rashi's commentary was inscribed in the form of large letters (as the Masoretes would sometimes do) displaying the names חננאל בן יצחק (in the opening of fols. 10v^11r) and יצחק בן חננאל (fol. 95r), as well as his own name בנימן הלבלר (fol. 94r).

We will end series of illustrations with one more codex from Ashkenaz. This region displays the highest rate of multi-handed manuscripts, and it is no wonder that the prevalence of the highlighting device was greater there. MS Jerusalem Heb. 8° 4012 is a maḥzor in the Western Ashkenazic rite for the special Sabbaths (the four Sabbaths preceding Passover), Passover and Pentecost, presumably copied in mid-fourteenth century. No colophon was found in the manuscript, and we therefore know nothing about the identity of the copyist. A careful examination of the volume reveals that the manuscript was produced by three hands, each with its own characteristics, whether codicological (such as the spacing of the pricking used for guiding the ruling and the configuration of the ruling emphasized by the use of plummet) or para-scriptural. And indeed, it turned out that within the respective segments of the copying associated with each hand a different name was highlighted at the beginning of the lines: חיים who copied fols. 1v-143v and disclosed his name on fol. 67r; יעקב who copied fols. 144r-241r and introduced his name in fol. 200r; יהודה who copied fols. 241r-253r and uncovered his name on fol. 241r.

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115 The name יעקב was highlighted in the section copied by Binyamin as well; he may have been the vocalizer of the manuscript who also took part in the copying and, since the manuscript lacked a Masora, permitted himself to allude to his name in the part he had vocalized but not copied.

The scribal custom of singling out one's own name by means of words or letters in the text was, no doubt, a matter of fun with a measure of vanity.[116] In light of this, the vehement condemnation of this practice by *Sefer Ḥasidim* is no surprise. We have seen that many hired scribes as well as those copying for their own use employed this artifice even when they had explicitly written down their names in the colophon; in such cases, the highlighting was obviously of little benefit. Yet whenever it was used in anonymous copies and especially in multi-handed manuscripts, this device provided a semi-covert means to disclose the names of copyists, and particularly those of secondary copyists who were not acknowledged in the colophon by the main scribe in charge of the production. The custom of name highlighting allows us not only to learn the first (and sometimes full) name of the anonymous copyist, but also to distinguish between the hands that participated in the copying. Those hands might have used different models or reflected different linguistic and scholarly traditions, which one ought to be able to tell apart when dealing with the version of texts. The mere discovery of the anonymous copyist's first name may in itself be of value: it could lead to the identification of his full name by comparing his hand and the codicological characteristics of his copying to those gleaned from dated (and perhaps localised) manuscripts copied by a scribe with an identical name, as has transpired on more than one occasion.

It is quite possible that the emergence of this phenomenon in Ashkenaz is no mere coincidence; moreover, its diffusion in that zone was rapid and it soon became common

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116 A jesting illustration of the frolics and vanity involved in the use of name highlighting is evident in manuscripts produced by Moshe ben Yehoshua' Merkes, a hired scribe of German origin, active in Italy in the late 15th century, whose jesting nature is apparent in his colophons (See Manuscrits médiévaux, I, 134, and in the Plates volume and in the addenda in Part III, p. xxvii). This scribe used to crown his name whenever it occurred. In MS Paris Hébreu 402 by his hand we find the verse / הרם המצנפת והסר העטרה כי לא נאה לכסיל השררה marked in the margins in a minute script, as if by the hand of one of the users but clearly inscribed by Moshe ben Yehoshua' himself. An identical rhyme in which he explicitly inserted his name appears in MS London Harley 150 (Margoliouth Catalogue 189), and in MS London Harley Or. 340 (Margoliouth Catalogue 869).

Simcha Emanuel recently noticed in a collection of responsa by Rabbi Meir of Rothenburg, copied by three scribes in Ashkenaz in 1391 (the manuscript was formerly kept in the Beth Din and Beth Hamidrash Library in London and was purchased in 1999 by the Jewish Museum in Berlin) a hitherto unknown expounding of the copyists' device: one of the scribes did not confine himself to ornamenting his name, his father's name, and his patron's name, but went even further to insert blessing formulas into the copied text following each occurrence of these names. See S. Emanuel 'Heʿara ʿal tekhniqa nedira shel maʿatiqim', Quntres: An Online Journal for the History, Culture and Art of the Jewish Book, 2/1 (2011), https://taljournal.jtsa.edu/index.php/quntres, pp. 59–61 (in Hebrew).

practice.[117] This may indeed indicate that the spread of the practice was intertwined with the growing production of multi-handed manuscripts, where, in many cases, only the main scribe would leave his mark in the colophon. Therefore it is not surprising that in the Oriental zones, in which the proportion of multi-handed copies was the lowest, the use of this artifice did not spread. If so, it may not have been mere conceit that originated it but, quite contrarily, the willingness of the main scribe to acknowledge his collaborators and allow them to immortalize their contribution in this humble manner. However, the said artifice was soon adopted by many copyists who implemented it even when their own names were properly indicated in their colophon.

2. Destination of copying

The indication of the patron's name most certainly contributes to our knowledge and understanding of the social and economic background of the production and consumption of books in the Middle Ages. Knowing whether a manuscript had been commissioned, and therefore copied by a hired, professional, or casual scribe, or whether it was produced personally for one's own use is of utmost importance not only for the history of the production of the Hebrew book but also for the study of Jewish literacy as well as for text criticism, and for elucidating the paths of Hebrew text transmission and their nature.[118] Generally, one can assume that hired scribes attempted to be truer to the model from which they copied, and yet were more vulnerable to the unconscious lapses caused by the complex psychological and physiological components of the copying mechanism. On the other hand, the copying of the learned who copied for their own use was critical and therefore more immune to the corruptions of texts due to the mishaps of the copying mechanism. This said, colophons of user-produced copies attest to the fact that their copyists did not regard their copying as a duplication, but rather as a critical enterprise that involved emendations of sorts based on knowledge, conjecture, the conflation of versions from other sources, and even the interpolation of related materials extraneous to the original text.[119] The unhesitating intervention of these learned copyists in the copied text renders void the advantages of

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117 The following are the rates of multi-handed manuscripts among the documented dated manuscripts until 1500: 14% in Byzantium, 12% in Ashkenaz, 9% in Sefarad, 8% in Italy, and 6% in the Orient (including Yemen).

118 For data on the distribution of the destinations of copied manuscripts see above, chapter 1, section 5, tables 11-13.

119 See in detail, below, chapter 13.

critical copying as well as the immunity from the perils of copying at large. While there might be some chance of removing the inadvertent corruptions of the text caused by professional copyists, it is unlikely that texts that had been amended by scholars could be restored.

Notwithstanding, one cannot ignore the socio-economic aspect underlying the destination of nanuscript production. One can assume that people chose the mode of user-production not only because they wished to produce an improved critical version of the text but for financial reasons as well, since copying for oneself was obviously much cheaper.

3. Dating systems

Hebrew scribes who added a colophon generally indicated the date of the copy completion in precise detail.[120] Not only was the year noted, but frequently also the month and the day in it, as well as the day of the week: the day of the month was indicated in 71 percent of the dated colophons (70% of the colophons in Ashkenaz, 71% in Spain, 73% in Italy, 81% in Byzantium, 64% in the Orient, and 62% in Yemen), and the day of the week was noted in half of them.[121] Moreover, even the hour of the day would sometimes be indicated: some one hundred colophons detail in which part of the day or night the copying was completed, particularly when occurring at night. Obviously, the fact that manuscripts were copied at all hours accentuates the free and independent nature of Hebrew book production.

Dates are presented according to four era systems: the first has the Creation as its epoch (namely, starting from the Creation); the era according to Contracts (*minyan shetarot*), which corresponds to the Seleucid era, having its epoch in 312 BCE; the era which has its epoch in the destruction of the second Temple in Jerusalem; and the Islamic era starting from the hegira. The Seleucid and the Islamic eras were used solely in the Orient. The only Jewish eras were those which had their epoch in the Creation and in the destruction of the Temple. In scores of manuscripts – most of which were copied in the Middle East and some in Italy – the date was noted according to two or even three parallel eras; in rare extraordinary instances from the Orient, scribes went as far as

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120 For a discussion of dates and eras, see Zunz, Zur Geschichte, pp. 214-230.
121 These data include indications of the weekly Tora reading, which are merely another form of indicating the day of the week and month. Appearing in only 6 percent of the colophons, this custom was prevalent in Ashkenaz (17%) and was known in Sefarad and in Italy (more than a third of the occurrences in Italy are in colophons by immigrant scribes, especially from Ashkenaz).

denoting five[122] and even seven[123] parallel eras, some of which were never in usage, but were based rather on computations based on events in the traditional rabbinical chronology.

a. The era from the Creation

The era starting from the Creation, which is still in use today, was the most common dating system among Jewish scribes. It was used in all periods[124] and zones, but in the Middle East and especially in Yemen it had never been the preferred calendar. It served as the standard dating system only in the European zones – in regions of Sefardic book culture and its offshoots, in Ashkenaz (northern France, Germany, and neighbouring areas), in Italy, and in Byzantium. The era starting from the Destruction (of the Second Temple) was seldom used in Europe and appeared only in some two dozen colophons in Italy (already in the earliest colophon, and at a relatively higher rate until the end of the thirteenth century), as well as in a few Byzantine manuscripts (among which the Seleucid calendar was also used): it never appeared on its own, and was always secondary to the basic dating according to the era from the Creation. This latter era was used in the Middle East in around one third of the colophons, sometimes alongside with other eras, while in Yemen it was hardly ever used (5% only).

The era from the Creation, similarly to other eras, was designated by a number of terms and formulas: לבריאת העולם (with different spellings in early colophons, e.g. לברײת

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122 See MS St. Petersburg Евр. I B 19a, copied in Cairo in 1008 (Codices hebraicis, Part I, Manuscrit 17).

123 MS Oxford MS. Poc. 99 (Neubauer Catalogue 1452), copied in the Orient in 1465. In addition to the seven eras, names of the months according to other era systems were used. The colophon, written mostly in Judaeo-Arabic, is as follows: וכמל הדא אלכתאב אלמבארך העבד הצעיר עבד התורה ועבד לומדיה יוסף הנשיא בן צדקה הנשיא בן ישי הנשיא בן יאשיה הנשיא בן שלמה הנשיא בן ידידיה הנשיא בן שלמה הנשיא בן יהודה הנשיא בן דוד הנשיא בן זכאי הנשיא השם יחיש לנו ביאת הגואל למען שמו ויקבץ נדוחי עמו ויבנה לנו בית אולמו ויקיים נאמו ויי״ר וכאן אלפראגׄ מנה סאבע כסליו שנת הרכ״ו ליצירה בתשע״ח ליציאת מצרים, ברצ״ח לבית ראשון אתתפ״ח לחרבנו, אתשע״ז לשטרות, אתשע״ז לסלוק הנבואה אשצ״ז לחרבן שני, ומן אשהר אלערב גמאדי אלאול סנה תת״ע ומן אשהר אלרום כאנון אלאול ומן אשהר אלקכט (fols. 131v-132r).

124 The earliest colophon to use the era from the Creation dates from 942/3. The earlier Oriental manuscripts employed the Seleucid era the era from the Destruction of the Temple. See Codices hebraicis, Part I, mss. 1-7.

126. למנין שאנו מונים פה ,לפרט היצירה **,לפרט האלף החמישי** ,לאלף החמישי ,לפרט האלף החמישי ,ליצירה[125] ,(עולם

When the annotation of the millennium was omitted, this was indicated with the term

לפרט or לפ״ק,[127] although the term לפרט would be used even if the millennium was indicated.

The difference between the Jewish dating according to this Jewish era and the Christian era is 3760. Calculating the date according to the era from the Creation for the purpose of juxtaposing it with the Christian era, which would later become the common civic dating system, could be performed by simply adding the number 1240 to a date in the sixth millennium, or 240 to a date in the fifth millennium. However, the Hebrew calendar is based on the lunar cycle with the addition of intercalated months, while the Christian calendar is based on the solar cycle, and therefore the beginning of the Hebrew year does not coincide with the parallel Christian year. The months of Tishrei-Kislev, as well as the first eight days of Tevet are always parallel to the Christian *previous* year, while any date after the 12th of Shevat is always parallel to the Christian year. In other words, it is impossible to know whether a date occurring in the narrow margin between the 9th of Tevet and the 11th of Shevat[128] falls on the parallel Christian

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125 The ancient distinction between the era from the Creation and the era from Adam, which began one year later and was in use until the middle of the 9th century, was no longer valid at the time of the earliest colophons of the 10th century. On this distinction, which was the cause of contradiction and confusion in the traditional Jewish chronology, especially in the transition period in which the era from Adam fell out of use, see A.A. 'Aqavya, The calendar and its use for chronological purposes, Jerusalem 1953, pp. 62-65 (in Hebrew); Idem, Sidrei zemanim le-fi ha-massoret be-tseruf midrash zemanim (sidrei zemanim be-divrei yemei Yisra'el ve-hu sefer ha-chronologia shel ha-historia ha'ivrit), Tel Aviv, 1943, pp. 301-307 (in Hebrew).

126 Especially in Sefarad and in Italy. This coinage does not appear at all in Oriental manuscripts. Its occurrence in MS Frankfurt am Main, UB Hebr. 4° 2, copied in נא אמון, i.e. Alexandria, in 1212, is no proof to the contrary, as this manuscript was copied by two Byzantine scribes and its codicological characteristics are typically Byzantine.

127 The acronym for לפרט קטן. Of course, the addition of the word קטן was superfluous, because the term לפרט already indicates the omission of the thousands. This term is relatively common in Ashkenaz (18%) and in Italy (16%). Its occurrences in Sefarad and Byzantium are negligible. In the Orient, the term occurs in one manuscript only, copied in Jerusalem in 1387 in an Ashkenazic script (MS Paris Hébreu 800, cf. Manuscrits médiévaux, I, 58). 60% of the term's occurrences in Italy in the 15th century (the period in which the use of the term spread) are in manuscripts inscribed by Sefardic, Provençal and Ashkenazic immigrant scribes, who copied 40% of the dated manuscripts produced in Italy in that period. The most prevalent use of the term is among Ashkenazic scribes, either in Ashkenaz – where it is found in 14% of manuscripts from the 14th century – or outside of Ashkenaz.

128 These demarcations are valid only until the end of 5343 (1582) – the transition from the Julian calendar to the Gregorian calendar, and similarly only from 842/3 (ד׳תרי״ג), the year in which the current Hebrew calendar was precisely determined (except for the years 922-924 [ד׳תרפי״ב-ד׳תרפי״ד], in which a bitter controversy broke out between the Palestinian and the Babylonian sages in regard to the calendar. See A.A. 'Aqavya and N. Fried, Calendar for 6,000 years, Jerusalem 1975/6, p. 33 [in Hebrew]).

year, according to the aforementioned calculation, or on the previous Christian year (according to the same calculation). To establish such dating it is necessary to consult synchronic chronological calendars.[129]

b. The Seleucid Era

The Seleucid calendar (the counting according to Contracts) was usually designated by the term לשטרות or without any term, as was done in recording dates according to the other calendars. In a few early Oriental manuscripts the date would be indicated as למנין שטרות.[130] In two dozen colophons from the late eleventh century[131] and until the end of the Middle Ages, it was designated as למספר יונים (according the calendar of the Greeks)[132]. Nearly all of these colophons are by Karaite copyists and inscribed in Arabic. From the fourteenth century some used the Aramaic form לשטרי, especially in Yemen, where scribes were fond of using Aramaic in colophons. The Seleucid calendar was used only in the Middle East,[133] where it was the standard dating system. It appears in 63 percent of the colophons of manuscripts copied outside Yemen. In Yemen itself

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129 The most transparent tables are given in E. Mahler's Handbuch der jüdischen Chronologie, Leipzig 1916. See also 'Aqavya and Fried, (above, n. 128). Mahler is extremely useful not only for converting dates, but also for checking Hebrew dates, e.g. if the day of the month matches the day of the week mentioned in the colophon; what date was noted in the colophon according to the weekly Tora reading (or the counting of the 'omer, or relative to a holiday) in that particular year. The advantage of 'Aqavya and Fried is their presentation of tables juxtaposing not only the Christian calendar but also other dating systems. However, several internet sites for converting and comparing dates of Hebrew and Christian calendars are now available.

130 See Codices hebraicis, Part I, mss. 5, 16, 17.

131 See Codices hebraicis, Part III, Manuscrit 47.

132 In the colophon of MS St. Petersburg Евр. II B 39, inscribed in Jerusalem in 988/9, the designation is למלכות יונים (See Codices hebraicis, Part I, Manuscrit 12). In the "Leningrad Codex" of the Bible it is למלכות יונים שהיא למנין {שטרות} ולפסיקת הנבואה (See ibid., ms. 17), and similarly, in the multi-calendared Oriental colophon cited in full (above, n. 123), it is לסילוק הנבואה. In MS New York MS 2367, copied in Italy, the designation is לשטרות שאנו מונין למלכות יון, and in the Karaite manuscript inscribed in 1399 it is לשטרות מלכות יון הרשעה (See Manuscrits médiévaux, I, 70). In a manuscript copied in Feodosiya, in the Crimean peninsula, in 1368 it is לשטרות של אלכסנדרוס (MS Leiden, University Or. 4769), and similarly in the Arabic form in a manuscript copied in Aleppo in 1472, it is למנין אסכנדר (See Manuscrits médiévaux, III, 14). The era according to Contracts was the standard dating system used in Syriac manuscripts, with formulations similar to those of the Hebrew colophons: in the 6th century the calendar it was named after Alexander, but sometimes למניין היוונים – this eventually becoming the standard formulation. See S.P. Brock, 'The Art of the Scribe', in The Hidden Pearl, ed. S.P. Brock, vol. 2, Rome 2001, p. 254.

133 Outside of the Orient only 7 dated manuscripts have been found whose copyists used the Seleucid era: 5 were copied in Byzantium (2 of them perhaps in North Africa, by a scribe מארץ יוון), one in North Africa, and one in Italy. In 3 of them it appears as an addition, parallel to other calendars.

– where the Jews continued to use it until they immigrated to Israel – this system was used almost exclusively (98%).

The dating according to Contracts used by the Jews, was in fact the Seleucid system, established throughout the Middle East in 312 BCE, after the conquest of Babylon by Seleucus I, Nicator (hence its designation למלכות יונים – the era of the 'Greek kingdom'). Jews employed it during the Hellenistic and Roman eras, as evidenced by the Book of Maccabees. It was adapted to the Hebrew calendar and began to appear in Jewish sources available to us from the Geonic period and in colophons from the very earliest extant manuscripts from the Orient. The dates noted according to this era and according to the era from the Destruction of the Second Temple cannot be calculated according to the Common Era or according to the Jewish traditional chronology, since their beginnings are subject to controversy. Our own calculations cannot be premised on either of these systems but rather on the practical tradition of the colophons' authors. These traditions are elucidated thanks to the colophons that register dates in parallel systems, using especially the era from the Creation, the dating of which is undisputed. The colophons using double (or several parallel) dating systems teach us that the Seleucid era is usually calculated according to the system whereby its first year is גיתי"ן (3450) to the Creation, in other words 312 BCE (one must therefore substract 311 – and at the beginning of the year, 312 – from the indicated year in order to calculate the year of the common era).[134]

C. The Era from the Destruction of the Second Temple

This era is usually designated with the omission of the word 'Second' (השני) or with the abbreviation 'to the destruction' (לחורבן), and in early Oriental manuscripts also with the words 'to the destruction of the Temple' (לחרבן בית המקדש[135] or לחרבן בית

הבחירה).[136] In most of the Italian manuscripts the designation is לחורבן הבית הקדוש

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134 See also 'Aqavya and Fried (above, n. 128), pp. 649-650. According to the tradition of the Syriac scribes, who used this era as the standard dating system since the 6th century, it began in October 311, and see Brock (above, n. 132), ibid. The mentions in the Book of Maccabees are inconsistent – some of them attest that the era began in Nissan, and one of them – in Tishrei. According to Greek sources it began in the autumn of 312 BCE, and according to the Babylonian Seleucid system – in the spring of 311. See E. Schürer, The History of the Jewish People in the Age of Jesus Christ (175 B.C.–A.D. 135), a new English version revised and edited by G. Vermes & F. Millar, vol. 1, Edinburgh 1973, p. 126. In any case, the practical usage in Jewish colophons does not attest that the counting began in any month other than Tishrei.

135 Codices hebraicis, Part I, Manuscrit 8, Part II, Manuscrit 32.

136 Codices hebraicis, Part III, Manuscrit 48. In a few late Oriental manuscripts: בית אלהינו (see e.g. Manuscrits médiévaux, III, 14.)

accompanied by the wish formula שיבנה במהרה בימינו (usually also followed by אמן

ואמן). Of the four eras, the use of this calendar was the rarest, and it appears in only

two percent of all colophons. Its greatest distribution was in the Orient where it appears

in six percent of manuscripts. Outside of the Orient its appearance is conspicuous in

Italian colophons from the mid-thirteenth century and on, although the number of

examples is very limited (only two dozen or so). Both in the Orient and in Italy, the use

of the dating from the Destruction was secondary and served as an addition to the era

from the Creation. This was also the case in Italy in all periods[137] and in the Orient,

except for its use in four early manuscripts whose scribes noted the date using only the

dating from the Destruction.[138]

When it comes to calculating the era from the Destruction of the Second Temple, the

historical date of which was 70 CE, the colophons employing a double dating system

demonstrate, as against the opinions of the Geonim, Maimonides, Rashi, and others,

that in practice it was usually calculated (not only in the Orient but also in Italy) by

counting the year 3829 (גיתתכ״ט) to the Creation as the first year to the Destruction of

the Temple.[139] Therefore 68 years (and at the beginning of the year - 67 years) must be

added to the year designated according to this calendar in order to reach the same year

according to the Common Era.[140]

d. The Islamic Era (Hijra)

The Islamic era was in common use only in the Oriental Muslim countries, where it is

found in more than a quarter of the colophons, with the exception of Yemen.[141] In more

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137 In Italian manuscripts this double dating would be introduced by the word והיא (that is).

138 Codices hebraicis, Part I, mss. 1, 4, 9; Part II, Manuscrit 32.

139 Indeed, one of the early double-dated colophons attests to a tradition that calculated the first year to the Destruction of the Temple as 3830 (גיתת״ל) (see Codices hebraicis, Part I, Manuscrit 8), and see further in the next note.

140 Presumably, according to this tradition, the Temple was destroyed on the Ninth of Av 3829 (גיתתכ״ט), as calculated by Maimonides; but contrary to his view, that entire year was calculated as year 1 to the destruction, and not from the month of Av to the month of Av in the following year. In this respect the practice conforms to the system of Rashi, who held that the reckoning began from the month of Tishrei that preceded the destruction (however, according to his system the destruction occurred in 3830 [גיתת״ל]). For the traditions and interpretations concerning the beginning of the era from the Destruction and scholarly views about the calculation of the date, see. H.Y. Bornstein, 'Ta'arikhei Yisra'el', Ha-Tequfa, 8 (1919/20), pp. 321-338 (in Hebrew). Cf. 'Aqavya, Sidrei zemanim le-fi ha-massoret (above, n. 125), pp. 313-314 (in Hebrew).

141 Apart from 4 manuscripts: 2 from Sefardic regions, and 2 unusual manuscripts from Yemen. One is by the prolific scribe Sa'adia ben David, who at a later date added the Yemenite moniker 'the-Adani' to

than half of these colophons the Islamic dating accompanies the Seleucid dating or another era. Almost ninety percent of its appearances are in Judaeo-Arabic manuscripts, most of them Karaite. The early designation of the Islamic era, preserved also in later periods, was למלכות קרן זעירה [142] and once [143] חסאב חסף טינה.

From the middle of the thirteenth century and especially from the fourteenth century onward we find the form לקרן זעירה (or in the vowel-deficient orthography זערה).[144] This formulation is used by Karaite copyists, and it appears in almost one third of the manuscripts that use the Islamic era. The term למלכות קרן / לקרן זעירה was coined based on Daniel 7:8 (קרן אחרי זעירה), according to a homiletic commentary in Judaeo-Arabic – attributed to Sa'adia Ga'on – which interpreted it as referring to the reign of the

his name, after migrating from Yemen to Syria and then to Palestine. There he also was known as an author, and between 1465 and 1485 inscribed some twenty manuscripts, half of which were autographed works. In the colophon of the single manuscript that has survived from his period of activity in Yemen, which he copied in Aden in 1451 in a characteristic Yemenite script (his script thereafter was an idiosyncratic mix of Yemenite and Oriental writing), he noted the year employing four eras – to the Creation, the Era of Contracts, the Muslim Era (לאלערבי) and the Persian solar era (לאלפארסי שימשי)! See MS Oxford MS. Hunt. 129 (Neubauer Catalogue 1521, and the relevant entry in the Neubauer & Beit-Arié Catalogue). On this author-scribe see also B. Richler, 'Al "midrash habe'ur" ha-Teimani u-meḥabro', Alei Sefer, 2, (1975/6), pp. 91-96 (in Hebrew). The other Yemenite colophon is included in MS London Or. 2348 (Margoliouth Catalogue 89), and was copied in 1469, probably in San'a. Its author is anonymous, but most probably should be identified with the highly praised Yemenite scribe, Benaya ben Sa'adia, the progenitor of the famous family of scribes that numbered four generations. On Benaya and his descendants see M. Beit-Arié, 'A Colophon-Poem in Yemenite Pentateuch Manuscripts', in Papers on Medieval Hebrew Literature Presented to A. M. Habermann on the occasion of his 75th birthday, ed. Z. Malachi, Jerusalem 1977, pp. 37-50 (in Hebrew). Cf. Manuscrits médiévaux, III, 112*. What makes this colophon unique was the fact that it was written in Arabic, in Arabic script, although the manuscript is a biblical one. Naturally, the only date used in the colophon follows the Arabic custom. The names of the person who commissioned the copying and of his forefathers were of course noted in their Arabic forms, but it is inconceivable that the owner was a Muslim, because he was designated as the "Israelite" (אלישראילי). As noted, the dating according to the Muslim era appears also in 2 manuscripts from Sefardic regions – one is a Judaeo-Arabic manuscript copied in Spain in 1375 (MS Vatican Vat. ebr. 426, fols. 102-176), and the other is a manuscript devoted to the calendar and astronomy, which contains, at the end of two Hebrew works on the astrolabe, colophons which were inscribed in 1482 in Syracuse, Sicily (MS Vatican Vat. ebr. 379, fol. 41r and fol. 50r). Each of the colophons notes the Hebrew, Christian, and Muslim date.

142 See e.g. Codices hebraicis, Part I, Manuscrit 17 from 1008; Manuscrit 33 from 1048; MS St. Petersburg Евр.-Араб. II 679, from 1156.

143 In a fragment of a Karaite manuscript in Arabic, MS St. Petersburg Евр.-Араб. I 831, (Codices hebraicis, Part II, Manuscrit 31). On the source of this formulation and its meaning, see ibid., n.1.

144 The formulation לקרן זעירה is followed in most colophons (already in MS St. Petersburg from 1156, which uses the formula למלכות) by the curse במהרה <או תשבר> תהרס.

Muslims.[145] A similar proportion of copyists – around a third – used the term לישמעאל and the others simply used the date without designating the era.

These colophons also used the Muslim calendric months and, in the Arabic way (and sometimes also in biblical Hebrew), the numbers of the years were noted in reverse order of the digits. The final letters מנצפ״ך represent the hundreds that are higher than 400 (which is the highest number represented in Hebrew by a single, non-final letter – *tav*). A final *kaf* represents 500, final *mem* – 600, final *nun* – 700, final *pe* – 800 and final *tsade* – 900.

Because the Islamic calendar is based on the lunar cycle without an intercalated month, there is no fixed formula allowing a comparison to the Hebrew or Christian calendar, and therefore for the determination of every date it is necessary to consult synchronic tables.

e. The Christian Era

Because of the Christian era's theological connotations (see below), it is no wonder that Jewish copyists in Europe did not use this dating system, unlike their brethren in the Middle East, where scribes, especially Karaite, did not hesitate to use the Islamic era, presumably because this historical reckoning, commencing with the Hijra – Mohammed's emigration from Mecca to Medina – was not loaded with theological meanings, or perhaps because of the Jews' very different attitude toward Christianity as opposed to Islam. The only colophons that nevertheless include also the Christian calendar are astronomical manuscripts and those containing calendric tables, the content of which dictate the inclusion of the Christian calendar. That said, there are a number of Hebrew manuscripts which dates of completion were noted only according to the Christian era, but those were not copied by Jews but rather by Christians, mostly converts. The most outstanding example of this are the many manuscripts – at least twenty, and at least eighteen dated ones – inscribed by Alfonso (Alonso, Alonzo) de Zamora in post-expulsion Spain, especially at the University of Alcalá de Henares, nearly all between 1516 and 1537. This convert, who undoubtedly was a professional scribe before converting to Christianity, produced manuscripts in a Sefardic calligraphic script. He stuck to all the scribal customs of Hebrew copyists, using also

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145 See Steinschneider, Vorlesungen, p. 55, which is based on Harkavy & Strack Catalogue, p. 265 (Cf. Codices hebraicis, Part I, Manuscrit 17, n. 9; Part II, Manuscrit 33, n. 1).

the standard formulas in the colophon or manuscript ending, except for the indication of the date, in which the mentioning of the birth or the coming of the Messiah, or of Jesus, or of the Redemption disclosed his conversion to Christianity (לביאת גואלינו מלך המשיח, משיח יהושע מושיענו ללידת, ישועתנו למנין).[146]

Unusual are another three manuscripts copied in Italy in the beginning of the sixteenth century by Jews, one of them a well-known author, commissioned by the hebraist Egidio da Viterbo, head of the Augustinian Order, subsequently appointed Cardinal in Rome. In the colophons of his manuscripts his commissioned copyists added the date according to the 'Christian era' out of respect for their patron, who was deeply interested in the Hebrew language and literature and especially in Kabbala.[147]

Despite the understandable aversion to using the Christian dating system the Jews of Italy were not averse to combining the Jewish year according to the era from the Creation with the day and month calculated according to the Christian era. Presumably, this usage, to which they were accustomed in their everyday dealings with their Christian environment, was devoid of religious connotation. More than one hundred colophons from 1353 and later included in their dating the day and the month in Italian, as in: 24 gennaio (January), <5>113 (כ״ד ביינרו קיי״ג) <1353>[148]; or 5 febrero (February) <5>131 (ה׳ בפיברו קלי״א) <1371>.[149] Combined forms included not only such hybrid usages – the day of the month and the Christian month together with the Hebrew year, as in these two early examples – but also the use of juxtaposed parallel forms, e.g.

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146 One example from a colophon of the Book of Exodus with a Latin translation (MS Madrid, Universitad Villa-Amil 12), which he inscribed in 1528 at Alcalá de Henares University, in order to make it available to students at the University library, reads: נכתב הספר הזה בכאן במתא אלכלה די איננאריש לתת אתו בבית הספרים שיועיל לכל התלמידים הבאים ללמוד מארץ אחרת ונשלם ביום ששי שבעה ועשרים יום לחדש נוביימברי שנת אלף ות״ק וכ״ח למנין ישועתנו על יד אלונשו די סאמורה והוא שחבר והדפיס דקדוק לשון עברית בלשון רומיית ברוך נותן ליעף כח ולאין אונים עצמה ירבה ונכתב ונשלם בימי המורה וחסיד ואיש ישר מושין פאשקואל מתקן ושופט בבית החכמה הזה תהלה לאל.

147 All of the manuscripts were copied by immigrants. MS Roma, Bib. Casanatense 2971, from 1513, MS London Harley 5704 (Margoliouth Catalogue 342) from 1514 – both a Sefardic script – and MS Munich Cod. hebr. 74, a concordance compiled in an Askhenazic script at Egidio's request by Eliyahu (ben Asher> Halevy, the renowned grammarian Eliyahu Levita Baḥur), in 1521. Beforehand, in 1516, Eliyahu ben Asher copied MS London Add. 27199 for the same owner (Margoliouth Catalogue 737). This manuscript is a large collection of works by El'azar of Worms. In this colophon Eliyahu did not include a Christian date, but described Egidio: אחד מחסידי אומות העולם <...> מכהני במות שנטו אגושטיני <...> ראש וקצין על כל כהני הבמות <...> אשר קנה והכתיב והוציא ממון רב <...> עד שיהיו לו כל הספרים הנמצאי׳ אצלנו (fol. 600v).

148 MS Firenze, Bib. Laurenziana Plut. 88.55, fol. 84v.

149 MS Jerusalem Heb. 8° 2002 (Manuscrits médiévaux, I, 35).

Tuesday 26 of Elul <5143> (which is) 25 August 5143 <1383> (יום ג׳ כ״ו באלול קמ״ג
וכ״יה באגושי קמ״ג לפרט לאלף שישי).[150]

4. Indication of locality

Colophons whose scribes indicated the location of production provide crucial information for the typology of Hebrew codicology and, of course, for historical research. Sometimes the copyist indicated not only the location in which the codex was produced, but also the town of origin and current residence of the owner, as in a manuscript copied in a Sefardic script in Ancona in 1402 by a hired scribe, who came from Perpignan, on behalf of an owner from Rome, who resided at that time in Casa.[151] As mentioned in chapter 1, section 3, forty three percent of the dated colophons include an explicit indication of locality, while the localities of six percent of the dated colophons may be surmised with a great degree of probability. The rates of locality indications in dated colophons differ from zone to zone. Here below are some figures representing the distribution of provenance. Since they comprise place-names that were not explicitly indicated in a colophon but were inferred - based on indications of locality made by the same scribe at proximate dates, or on solid historical information - the figures which represent explicit localities are shown in parentheses. These data pertain to documented manuscripts dated before 1500: From the zones of Sefardic culture (including North Africa, Provence and Languedoc, Sicily) – 52% (49%); Italy – 58% (51%); Byzantium – 45% (36%); the Middle East (excluding Yemen) – 47% (41%); Yemen – 60% (57%); Ashkenaz (Germany and France) – 22% (18%). The rate of localised colophons from the Ashkenazic zone is obviously the smallest. This puzzling avoidance of indicating the locality of production by the majority of Ashkenazic scribes makes it difficult to distinguish between the codicological traits and the script style of the manuscripts produced in France and of those produced in Germany, or to substantiate indications pointing to such a distinction.

Names of localities were usually transcribed into Hebrew using the toponym commonly employed by Jews at the time of the colophon's inscription. Deciphering those toponyms requires not only familiarity with transcription conventions in each zone, but

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150 MS Paris Hébreu 1234 (Manuscrits médiévaux, I, 53).
151 MS Oxford MS. Opp. Add., fol. 37 (Neubauer Catalogue 302).

also acquaintance with the historical place-name.[152] In Germany, the ancient Latin name would sometimes be transcribed, not the German one. In Spain, even after the Christian Reconquista, Arabic place-names would usually be used rather than the Spanish forms which succeeded them, e.g. טליטלה / טוליטלה (Toledo) – which was a precise transcription of the Arabic طليطلة, in itself a descendant of the Latin name Toletum; or אשביליה (Seville). The toponym מרצה עלי (Marsala, Sicily) shows a precise transcription of the Arabic name مرسى علي. In order to identify Italian names, for example, one must be aware that Italian Jews transliterated the consonant גי (ge, gi) with two *yod*s, and therefore Reggio (Emilia) was transliterated רייו(א),[153] and similarly Sant'Angelo – סי אניילו.[154]

In the Middle East, localities were sometimes indicated by means of Hebrew toponyms from the Bible, anachronistically ascribed by Jewish biblical commentators to well-known cities (and to countries such as Spain ['Sefarad'] and Germany ['Ashkenaz']). Thus נא אמון was used as the Hebrew name for Alexandria, appearing already in the Aramaic version of this name in the Bible translation (Nahum 3:8);[155] צובה (1 Samuel 14: 47, etc.) appears as the name of Aleppo;[156] אי כפתור (Jeremiah 47:4) indicates Dumyat in Egypt,[157] and אוזל (Genesis 10:27) is used for San'a.[158]

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152 See the pioneering article by Zunz on toponyms in Spain and in Provence in Hebrew sources: L. Zunz, 'Ueber die in den hebräisch-jüdischen Schriften vorkommenden hispanischen Ortnamen', Zeitschrift für Wissenschaft des Judenthums, 1/1 (1823), pp. 114–177. For additional sources, other than Zunz, for the identification of names, see Steinschneider, Vorlesungen, pp. 52-54.

153 Appearing already in the early colophon inscribed there in 1396 (MS Oxford MS. Hunt. 300, Neubauer Catalogue 305), but immigrants from Spain and Sicily transliterated an identical toponym, Reggio di Calabria (at the southern tip of Italy) as ריגו (always with a diacritical point over the gimel).

154 Appearing already in 1326 (in MS New York MS 2699a, a colophon on a single folio that survived from a manuscript).

155 See Codices hebraicis, Part III, Manuscrit 54, copied in אסכנדריא (Alexandria) in 1122. See ibid. on another manuscript by the same scribe, copied in נא אמון in 1141. And see also ibid., Part IV, ms. 99, dated 1199.

156 Already in documents from the early 11th century.

157 See Codices hebraicis, Part III, Manuscrit 69; Part IV, Manuscrit 77, and in many documents.

158 See Beit-Arié, 'A Colophon-Poem' (above, n. 141), pp. 43-46.

Another method sometimes in use in Italy was calque translation, such as כפרים שלושה (probably Treviglio),[159] שמח לב (Crevalcore),[160] הר נאה (Belmonte).[161] Locations in which manuscripts were produced range throughout all regions in which Jewish communities were present, from Iran[162] and Bukhara to Yemen, from North Africa to the Caucasus, from Al-Andalus to Flanders, from the Rhine Valley to - at a later stage - Prague, Poland, Ukraine, and southern Russia. Scores of colophons indicate localities for which we have no other evidence of the existence of a Jewish community but the colophon itself, thus constituting an essential documentary source.[163] In the Iberian Peninsula, for example, manuscripts bear the place-name of ninety localities.[164] Despite the accidental nature of their survival, the number of extant manuscripts from the various communities is a valuable social indicator of the intellectual level of the community, its centrality, and its size. The following examples are based on dated manuscripts and on undated but localised ones, e.g. 37 manuscripts inscribed in Jerusalem in the years 989-1072 (8 manuscripts) and 1366-1532 (29 manuscripts, some of which are non-localised, yet could be localised based on other manuscripts copied by the same scribe and at around the same time, or based on historical information).[165] 52 manuscripts (13 of them localised by conjecture) were inscribed in Cairo (including Fusṭāṭ) consecutively from 1006 until 1540. 56 manuscripts were copied in Ferrara,

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159 In a cryptic colophon from 1358 in MS Oxford MS. Can. Or. 33 (Neubauer Catalogue 317, and cf. the same entry in the Neubauer & Beit-Arié Catalogue).

160 For the first time in 1428, in MS Oxford MS. Opp. 598 (Neubauer Catalogue 1260). The plain meaning of the Italian name is actually the opposite (heart-breaking), but the Hebrew translation was either euphemistic or a preserved 200-year old tradition, when the town adjacent to Bologna had been called for a brief period Allegralcore, i.e. heart-cheering (personal communication by Mauro Perani).

161 A colophon from 1448 in a manuscript kept in the Montefiore collection (MS London, Jews' College 15), and recently put up for sale (Sotheby's Catalogue, October 27&28 2004, no. 15). משמח

162 The earliest dated colophon, which date is unquestionable (903/4), is also the earliest colophon containing an indication of locality – Iran (see Codices hebraicis, Part I, Manuscrit 2). Similarly. in the manuscript of Prophets, apparently copied by Moshe Ben Asher even earlier (894/5), which until recently had been considered the earliest dated codex, the location of copying, Tiberias, was also noted (see Codices hebraicis, Part I, Manuscrit 1).

163 Michael Riegler wrote a doctoral dissertation, which I supervised, about the colophon as an historical source; in it he detailed these localities in Spain, France, Germany, North Africa, Italy, Greece, and in the Middle East. See M. Riegler, 'Colophons of medieval Hebrew manuscripts as historical sources', [Jerusalem] 1995 (Dissertation, in Hebrew, the Hebrew University).

164 See a detailed list of localities in which manuscripts denoting their date were copied (and also a list of all the Iberian manuscripts arranged by their date), in M. Beit-Arié, 'Colophoned Hebrew Manuscripts Produced in Spain and the Distribution of the Localised Codices', Signo: Revista de Historia de la Cultura Escrita, 6 (1999), pp.161–178.

165 The reason for the long intermission in copies produced in Jerusalem was the crusaders' conquest of the city and banning the Jews from settling there.

Italy (in 4 of them the locality was conjectured) between 1396 and 1534, most of them produced in less than a century, namely between the years 1446 and 1534.[166] More than two thirds of the manuscripts produced in Ferrara from 1396 to 1534 were inscribed in Sefardic script. From the period between 1198 and the year of the expulsion from Spain (1492), in 23 extant manuscripts Toledo was explicitly mentioned as location of production, in addition to 3 which should be localized there by conjecture. Several other manuscripts that were apparently produced in Toledo are mentioned in halakhic literature. In Candia (Iraklion), Crete, 24 manuscripts were copied in 1375-1540 (of which 10 are localized by conjecture). In Avignon, 14 manuscripts were copied in the years 1378-1530 (of which 2 are localized by conjecture), while in Worms during the years 1325, 1450-1525 only 8 manuscripts were copied (half of which are localized by conjecture).

Copyists sometimes specified the exact whereabouts in which the copying took place, such as the home of the patron who commissioned the copy,[167] a certain yeshiva, an attic, or even a prison. Several examples follow:

Me'ir ben Moshe, who copied a manuscript in Camerino, Italy in 1399 for Binyamin ben Yitsḥaq, notes that he copied it while staying in his home and being supported by him (והעתקתיו בביתו ובהיותי סומך על שולחנו).[168] Similarly Yehuda ben Shelomo of Camerino noted that he produced a manuscript in 1439 for Yo'el ben Avraham of

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166Testimony that a manuscript had been inscribed in Ferrara as early as 1278 appears in a late manuscript containing a copy of the original colophon, according to which the original manuscript had been copied there on that same year by Avraham ben Yom Tov HaCohen, a prominent scribe active in Rome in the late 13th century. On the same Avraham ben Yom Tov HaCohen, see below, n. 209.

167 As evidenced by a number of colophons, some of which are presented below. It is reasonable to assume that the copying would be performed at the residence of an individual who could afford to hire a scribe to produce his books, and that this may have meant not only the provision of comfortable conditions for copying and a material bonus for the scribe but also the owner's role in obtaining the copy, assuring its protection and its proper handling. It may have well been that providing accommodation for the copyist in the home of the patron was a common custom, as suggested by the response of Shimshon ben Avraham of Sens relating to salaried artisans who dwelt in the home of their patron for extended periods of time (I am indebted to Simcha Emanuel for drawing my attention to this rabbinic source – as well as to many others – which sheds light on the processes of book production). Shimshon ben Avraham mentions only two such instances of hired artisans – teachers and scribes: וכתב רבינו שמשון בר׳ אברהם זצ״ל שאם יש לאדם סופר או מלמד בביתו ('Or Zaru'a, Zhitomir 1862, section 172, and formulated in similar language in Tosafot on Eruvin 72b lemma ומודין).

168 MS Oxford MS. Mich. 384 (Neubauer Catalogue 187). Its Sefardic script attests to the scribe having immigrated from Spain or Provence, presumably in wake of the persecutions of 1391. See more on this scribe below, in the text referenced by n. 187.)

Recanati, who resided in the town of Macerata, and that the copying was done in his patron's own house in Visso (Italy) where he would stay with him 'year by year' (וכתבתיהו פה בוויסי בביתו ממש בהיותי מתגורר עמו מדי שנה בשנה).[169] Again, in Italy, one scribe noted having completed his copying in 1470 on the day he left Massafra, where he was treating the Captain (ביום מוצאי בעיר משאפרא בעמדי שהייתי במגדל מרפא הקפיטנייו).[170] Yitsḥaq Ibn Shoshan, who had been expelled from Spain, notes in the colophon of a codex which was presumably meant for his own use that he copied it on the seaside of Tunis, in La Goulette, at the home of Rabbi Ḥaim and Rabbi Makhlouf Abul'eish (ר' חיים ור' <...> בשפת הים של מדינת תניס הנקרא גוליטא בלעז בבית המעולים מכלוף אבולעיש יי"א במעלה הלוחית שנתנו לי לישב).[171] Binyamin ben Yo'av notes in his colophon dated 1403 that he copied the manuscript while in jail in Bologna (בהיותי במיצר בעיר בולוניא אז ולבי היה סגור בחותם צר, גם לא היה לי סמך מספריי <...> יזכני לראות בניי שמסיבתם נכנסתי לפנים ולפניי).[172] Yet another scribe, who copied MS New York MS 8227 in Paris in 1390 in a Sefardic script, achieved his copying in prison: אני אברהם ב"ר שלמה נבתוי"א הררי המכונה דבנ ויולש כתבתי זה הספר הנקר' עמודי גולה וסיימתיו בעיר פריש בתפיסה עירון <!> השם יוציאני ממאסר ויתיר אסירי עמו ישר' (fol. 287r). Another manuscript copied in jail was MS Parma, Parm. 2977 (De-Rossi Catalogue 453), copied in a cursive Ashkenazic script by Yehoshua' ben Meir ben Yitsḥaq in Cremona (Italy) in 1480: סיימתי זה ה<ר<לב"ג בפני השער קרימונה בבית אחד אשר עמדתי שם ג' חדשים שלימים ובכה ומתודה על חטאיו <צ"ל: חטאיי> יום יום <...> ואנא אלהי אברהם יצחק וישר' שתוציאני מן הבית הזה אשר אסרתי שם ג' חדשים (fol. 89r).

Fifteenth-century manuscripts copied in yeshivas or *batei midrash*, chiefly Sefardic - most of them in Spain itself and some in southern Italy and, after the expulsion from Spain, in Morocco and Palestine - were discussed above at the end of chapter 1.

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169 MS Hamburg Cod. Levy 3 (Róth & Striedel Catalogue 17). These colophons, like others from 15th-century Italy, shed light on the circumstances of salaried copying. Hired scribes would sometimes join the patron's household for the purpose of the copying. In one of the cases cited here, this arrangement - according to the scribe's colophon - would be renewed annually.
170 MS Paris Hébreu 210 (See Manuscrits médiévaux, I, 131).
171 MS Paris Hébreu 769 (See Manuscrits médiévaux, III, 51).
172 MS Paris Hébreu 814 (See Manuscrits médiévaux, I, 79). The manuscript's codicological characteristics confirm the copyist's claim: indeed, because of the lack of ruling tools the manuscript had been ruled as best he could, by folding the folios, and produced rather sloppily. The copyist hints that the reason for his incarceration was connected to his sons.

5. **Personal and historical information**

Some copyists would include in their colophons information about their personal lives, as could have been observed in some of the above quotations which concerned some scribes' indications as to the exact location of production. These pieces of information could, for instance be, the mention of the copyist's age,[173] which appears mainly in in Italian colophons. The youngest copyist mentioned was twelve years old[174] and the oldest was seventy nine.[175] The following are selected examples: Shemuʻel ben Shemuʻel of Modena copied a manuscript in Italy in 1475 at the age of fourteen.[176] The copyist of a manuscript, produced for his own use in Perugia in 1366, noted his age: וכתבתיו בהיותי בו בחמשה עשר שנים.[177] Another Italian colophon, inscribed in a Sefardic script by Shelomo HaLavan the physician, son of Yitsḥaq HaLavan, in Crotone (Calabria) in 1472, mentions his age as twenty four years.[178] It seems that copyists tended to note their ages to express pride at their ability to produce a manuscript at either a young or advanced age. Other examples are of copyists aged sixty and upward:

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173 Cf. M. Riegler, 'Colophons,' above, n. 163.

174 MS Livorno, Talmud Tora 41 (C. Bernheimer, Catalogue des manuscrits et livres rares hébraïques de la Bibliothèque du Talmud Tora de Livourne, Livorno [1915], no. 41; M. Perani, I manoscritti della Biblioteca del Talmud Torah di Livorno, Livorno 1997, no. 6), fols. 1-75, which were copied in 1520/1 by two brothers, David and Moshe sons of Avraham Provençal, apparently in Mantua. Moshe, who eventually became the greatest among Mantuan rabbis (see S. Simonsohn, History of the Jews in the Duchy of Mantua, vol. 2, Jerusalem 1977, pp. 728-730), indicated his young age in three colophons he inscribed (fols. 8v, 66r, 75r). His brother David did not mention his age, yet it can be calculated: in the colophon of MS Budapest, MTA A80, copied by David in 1519, he noted his exact age – thirteen years, nine months, and eighteen days; if so, he would have been around fifteen when copying MS Livorno together with his brother. Fols. 76-145 in the same volume were copied in 1522 for David by Elia of Modena son of Yosef of Modena! It follows that already at age eighteen he had a manuscript copied for him.

175 The scribe בן לוי (and also בן לוי ז״ל) who copied in Bologna in 1423 in a semi-cursive Sefardic script MS Paris Hébreu 1283, noted at the beginning of the first colophon (fol. 101r): ניסן שנת ברוך אל חי לעד ראשון הוא למספר ימי שנותי <...> והתהלה לשוכן שחקים לא כהתה עיני (See Manuscrits médiévaux, II, 62). The year he indicated in gematria was ק״יד (1334), and undoubtedly this was the year of his birth, as later in this colophon and in another one as well he noted the date קפ״ג (also employing gematria) as the year of the copying; it thus follows that he was seventy nine. MS London Harley 5722 (Margoliouth Catalogue 126) was copied in a square Sefardic script in Bologna in 1428-1429, by בן לוי ז״ל, according to the sixth colophon on fol. 160v, and according to the fragmented colophon on fol. 349v by הלוי ז״ל מ[שה?] ב״ר. A comparison of the para-scriptural characteristics of this manuscript with those of MS Paris leads to the assumption that they are both by the same hand. If this is so, בן לוי would have been eighty five when copying MS London!

176 MS New York MS 8263. During the ten ensuing years this scribe copied three more manuscripts which have survived.

177 MS London, Beth Din 48 (offered for auction at Christie's in 1999).

178 MS Paris Hébreu 940, fol. 104v (Manuscrits médiévaux, I, 131).

the copyist of MS Cambridge Add. 376 was sixty years old. The scribe of MS Munich Cod. hebr. 3, a maḥzor that was completed in 1459/60 in Ulm, Germany, boasts in his colophon, inscribed in large characters, that he was sixty one years of age, and that he copied the maḥzor without using spectacles: בן אחד וששים שני אנכי, כתבתי זה המחזור בלא כלי זכוכיות המאירים לעיניים הנקראים ב״א ‹בלשון אשכנז› ברילן.[179] Three manuscripts were copied by scribes aged sixty three: MS London Add. 17806 (Margoliouth Catalogue 962), completed in Italy in 1384;[180] MS Oxford MS. Hunt. 309 (Neubauer Catalogue 1550), copied in Thebes, Greece in 1415 in a Sefardic script by Shem Tov the physician, son of Yaʿaqov אבן פולייא of the city of Toledo, who wandered among Greek towns and copied a few manuscripts, particularly Kabbalistic ones, in the beginning of the fifteenth century;[181] MS Vienna, ÖNB Cod. Hebr. 179 (Schwarz Catalogue 30), copied in Provence in 1432. And in 1456/7, at the age of seventy, the poet and scholar Moshe ben Yitsḥaq da Rieti copied - probably in Mantua - philosophical works for his sons, so that they not be absent from the collection of books he himself had copied, commissioned, or bought for them: כתבתי הספר הזה עם קוצר השלמות אשר בהעתקתו בהיותי בן שבעים שנה לחיי בשרי שהיא שנת וירא שנת ראשית לו לאלף הששי למנין לא יחסר לבני גם את זה בין שאר הספריי אשר כתבתי והכתבתי וקניתי להם בבחרותי מוסף על מה שכתב כא״מ ע״ה וימצאו חן שכל טוב בעיני אלהים ואדם. סלה.[182]

Information on the exact fees of hired scribes, cited from documents, literary sources, and indications by owners in chapter 1 above, at the end of section 5, exists only in a small number of colophons, nearly all of them from Italy. In Italian colophons it was,

179 Cf. the colophon of MS Paris Hébreu 31 (Manuscrits médiévaux, II, 45), inscribed in Zaragoza (Spain) in 1404: ‹...› עם מראות זכוכית בין שתי עיני וכתבתי (the scribe did not mention his age).
180 At the end of the copying, before the colophon, the copyist wrote: בן ששים ושלש שנה אנכי היום וסימנהון ה׳ צבאות יגין׳ עלינו ועל עמו ישראל בכל מקום מושבותינו אמן (fol. 300r).
181 In the first of four colophons he inscribed in this manuscript, fol. 5v, he indicated his age, known by an inscription written by his father. In the fourth colophon, copied in Philippopolis (Plovdiv, Bulgaria), he incorporated some details concerning the circumstances of his 18-day stay in the home of R. ʾAharon, while suffering from gout: והייתי חולה מן הפודגרא ועמדתי שם י״ח ימים חולה בבית הנכבד ר׳ אהרן (fol. 159v). On the copyist, who, in the third colophon (fol. 120r), expressed a wish that he might arrive at 'the land of the gazelle' (Eretz Israel) during his lifetime, and inserted in his copying a remark about the persecutions of 1391 and other events, see J. Hacker, 'Aliyat yehudei Sefarad le-Erets-Yisra'el ve-ziqatam 'eleha bein 1391-1492', Shalem, 1 (1974), p. 114 (in Hebrew), and in the appendix (pp. 133-137, in which colophons from this manuscript are cited).
182 MS Firenze, Bib. Laurenziana Conv. Soppr. 12, fol. 129v. Moshe da Rieti copied MS Parma Parm. 2126 (De-Rossi Catalogue 1376) in 1435/6 in Perugia and in the colophon also noted his age at the time: ולחיי בשרי חיילי, namely 48 years.

however, common practice to mention the fact that the scribe had received his fee from the patron who commissioned the manuscript, without specifying the sum, and using usually the standard formula: [183] דמי שכירותי or sometimes וקבלתי שכירותי / שכרי משלם, המעות or שכר טורחי. The earliest colophon that mentions a scribe's fee appears in one of the earliest Italian manuscripts, inscribed in 1145.[184] In a manuscript of Prophets, produced by an Ashkenazic copyist for his own use in 1335, the vocalizer added a brief colophon in which he noted his fee as 35 dinars and the duration of the job as three weeks.[185] Similarly, a fifteenth-century vocalizer in Italy reported in his colophon his fee being five florins (פרחי<ם>).[186] In a colophon of a manuscript of Rashi's commentary on the Pentateuch, inscribed in Camerino in 1399 at the home of the patron who commissioned the copy, the Sefardic scribe, Meir ben Moshe, mentioned his fee as 4 florins, not including the reimbursement for expenses.[187]

A unique documentation, not only of the scribe's fee but also of other expenses involved in the production of a manuscript, as well as information about the quality of the model, is preserved in MS Moscow, RSL Guenzburg Collection 606. On fols. 27-90 the commissioned scribe Avraham <ben Yitsḥaq> of Jerusalem (אסיר התקוה),[188] copied Kabbalistic works in an Ashkenazic script in Venice, 1393. In his colophon, the scribe

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183 Namely, מְשֻׁלֵּם (מן שלם, in full, in Mishnaic Hebrew, see. H. Yalon, 'Mi-shalem,' Tarbiz 1/1 [1930], pp. 153-155 [in Hebrew], and also the editor's note by Y.N. Epstein, ibid., p. 55).

184 In MS Milano, BA A 186 inf. only two quires relating to biblical grammar and cantillation survived from a full vocalized Bible, as indicated by the colophon. The scribe Menaḥem ben Shelomo was the author of the Midrash Sekhel Tov and of the grammatical treatise 'Even Boḥan. When the name of the patron who commissioned the manuscript was erased and the name of a later owner inserted instead, the exact fee received by the learned scribe was scraped away and only the indication of the Italian currency survived. See Codices hebraicis, Part IV, Manuscrit 71.

185 MS Parma Parm. 3104 (De-Rossi Catalogue 20, Richler & Beit-Arié Catalogue [Parma] 284), fol. 284v.

186 MS Oxford MS. Can. Or. 22 (see above, chapter 1, end of n. 148). פרחים (sometimes פרחים רחבים) is a calque translation used by Italian Jews to designate Florentine gold coins (fiorini or fiorini larghi).

187 MS Oxford MS. Mich. 384 (Neubauer Catalogue 187), fol. 141v. For the payment received by the scribe who completed 28 bifolia in Provence, circa 1423, see below, chapter 4, beginning of n. 3.

188 My discussion of this scribe and of the manuscripts he copied (see M. Beit-Arié, 'Hebrew Manuscripts Copied in Jerusalem before the Ottoman Conquest', in Jerusalem in the Middle Ages: Selected Papers, ed. B.Z. Kedar, Jerusalem 1979, pp. 261-268 [In Hebrew]; Manuscrits médiévaux, I, 71) should be corrected in light of Elhanan Reiner's comment ('Bein Ashkenaz li-yerushalayim: ḥakhamim Ashkenazim be-Eretz Yisra'el le-aḥar "hamavet hashaḥor"', Shalem, 4 [1984], pp. 55-56 [in Hebrew]), recognizing that MS Paris Hébreu 803, which seemed to have been copied by this scribe, was actually a copying of a manuscript inscribed by Avraham ben Yitsḥaq, including the original colophon. Indeed, the watermarks of MS Paris Hébreu 803 are from a later date. See M. Beit-Arié, 'Ketav yad Paris, sifriya le'umit hébreu 803', Kiryat Sefer, 60 (1985), p. 332 (reprinted in Mi-ginze ha-Makhon le-Tatslumei Kitvei ha-Yad ha'Ivriyim, ed. A. David, Jerusalem 1995, p. 119 (in Hebrew).

noted the superior quality of the vorlage from which he was copying, which model had been proofread by its author: והעתקתיו מכתיבת יד מוה״ר פרחיה איש ירושלם ודיינה זצ״ל ,וכתב וז״ל <וזה לשונו> והיה בספר שהעתקתי ממנו הגהת יד המחבר, thus also providing important information regarding the process of textual copying, to be discussed below. Following the colophon, this hired scribe detailed the production expenses: paper - 11 dinars, ruling - 24 dinars, copying - 4 ducats and 45 dinars, altogether amounting to 5 ducats.[189] The breakdown of the costs shows that copying was the main expenditure. Surprisingly, the cost of ruling, which had never been recorded as a separate component of production, was more than double the cost of the paper.[190]

Scribes would sometimes incorporate in their colophons contemporaneous historical information, which in most cases, involved personal information. Some of those who had been expelled from Spain and Portugal, as well as Sicily, would mention the expulsion in the colophons inscribed in the years immediately subsequent to the expulsion, and some would reckon the years from the time of the expulsion. Some colophons would tell about natural and other disasters. In a manuscript copied in Spain, probably in Seville, in 1356 an earthquake was is recorded: ובשנה הזאת ביום רביעי שבע עשרה באלול געשה ורעשה הארץ ונפלו באשביליא חומות ובתים רבים ונפלו התפוחים שבראש המגדל הגדול וכן אירע בלישבונא ובמקומות אחרים, השם ברחמיו יהיה מחסה לעמו וירם קרן משיחו.[191] In 1495, a scribe copying for himself in a Sefardic script in Naples reported an earthquake that occurred on the day he completed his copying: ובו ביום שעה וחצי

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189 Fol. 90v. This inscription was discussed by Dukan: M. Dukan, 'De la difficulté à reconnaître des instruments de réglure: Planche à régler (mastara) et cadre-patron', Scriptorium, 40 (1986), p. 251.

190 Some fifteen years earlier, in 1384/5, Avraham ben Elia from Imola in northern Italy noted the price of paper while listing one of his books in his library inventory (being probably the earliest of the known dated Italian book-lists): <...ועוד א׳ סידור מכל תפילות השנה> וכתבו אלי מר׳ משה בכ״ר מתתי׳ כ״ב בשכר עשרה דוקטי לבד הקווינטירני <quinterni are 5 bifolia quires, but also quires generically; see below, chapter 4, under the heading 'composition of the quires'> <שקניתי ממעותי זה היה שקמ״ה 1384/5> והקווינטירני עולים ה׳ דוקאטי וי׳ בולונייני. See Bonfil, 'List of Hebrew Books', p. 61, no. 20. Bonfil notes 'that the price of paper was the equivalent of 350 kg of bread or 350 litres of wine, and was more than half of the sum received by the scribe [trans. I.G.]'. In comparison with the overall cost recorded in MS Moscow, it should be taken into account that the scribe's fee probably included the ruling of the quires purchased by the person who commissioned the copying. It is unlikely that in 1384/5 ruled quires were already being sold in Italy, as was common in the 15th century when quires were ruled in ink, apparently in a mass mechanical production process, and were distributed in stationeries (see below, chapter 6, in the discussion of ruling, section 3c).

191 MS Milano, BA E 149 inf. (Bernheimer Catalogue 9). Cf. Berliner, 'Ein Gang', pp. 104-105. In the colophon of MS Jerusalem Heb. 8° 6287 it is stated that the copying was completed in Avila on 8 Tamuz 1438 and that the great fire in Segovia had occurred on the second day of that month.

קודם עלות השחר רעשה הארץ השם יצילנו מכל מיני פורעניות המתרגשות לבוא בעולם, והשלמתיו

לצורכי.[192]

The most emotionally wrenching colophon, an altogether staggering historical and personal document, had not been inscribed by the scribe, but rather by the vocalizer-Masorete of a manuscript of Prophets and Hagiographa (MS Vienna, ÖNB Cod. Heb. 16 [Schwarz catalogue 5]). When the Masorete reached the opening that begins with

the middle of Psalm 17, he began writing in the lower margins of the pages a colophon in very large letters composed of the Masora Magna inscribed in a minute script, following the Hebrew micrography tradition elaborated by the Masoretes. The colophon, extending over the openings of fols. 249r-268r (until the middle of Psalm 105), reports that its author had begun to vocalize and annotate the Masora in 1298, in commemoration of one hundred and forty six communities that had been ravaged and plundered

on that year. In that carnage he himself lost his wife, his two children, and both a brother and a sister:

התחלתי למסור ולנקד בשנת מטה ידינו ותש כוחינו ב'י'ו'ם' <=נ"ח, 1298> אף ה' ונהרסו קהילות הקודש ונהרגו ידידי עם קודש וגם בערי הפרזי הרבה מאד מאה וארבעים וששה יישובים ובבזה שלחו את ידם ולא השאירו עוללות ולי אני העלוב אברזוש נהרגה אשתי ושני בניי בת ו'ב'ן' <=נ"ח> חזקיה בני ילד שעשועי על כן המו מעי לו וגם אחי בחור נעים ונחמד ואחותי בחורה נאה וחמודה יזכרם אלהינו ישראל מ'את א'ומה ז'ו' ה'רשעה <=נ"ט, 1298/9> אשר שפכו דם כמים ואין קובר תרעם בשבט ברזל ככלי יוצר תנפצם בשנת ט'ן' <נ"ט> לפרט דבר זה נחרט לטובה עם שאר צדיקי עולם וכתבתי לזכרון לפני ה' תמיד ולנקום נקמת בני התחלתי למסור ולנקד בשנת מטה ידינו ותש כוחינו ב'י'ו'ם' <=נ"ח, 1298> אף ה' ונהרסו קהילות הקודש ונהרגו ידידי עם קודש וגם בערי הפרזי הרבה מאד מאה וארבעים וששה יישובים ובבזה שלחו את ידם ולא השאירו עוללות ולי אני העלוב אברזוש נהרגה אשתי ושני בניי בת ו'ב'ן' <=נ"ח> חזקיה בני ילד שעשועי על כן המו מעי לו וגם אחי בחור נעים ונחמד ואחותי בחורה נאה וחמודה יזכרם אלהינו ישראל מ'את א'ומה ז'ו' ה'רשעה <=נ"ט, 1298/9> אשר שפכו דם כמים ואין קובר תרעם בשבט ברזל ככלי יוצר תנפצם בשנת ט'ן' <נ"ט> לפרט דבר זה נחרט

These were indeed the gory pogroms that took place in southern and central Germany between 20 April and 19 October 1298, known as the Rindfleisch persecutions,[193] that the vocalizer-Masorete was describing. According to his account, thousands of Jews had been killed in a wave of massacres in those communities.[194]

6. Information on copying circumstances and on the quality of the exemplar

The two previous sections presented select examples of colophons containing personal information about the copyist and about the specific location of the copying (e.g. the patron's home, or prison), shedding some light also on the circumstances of the copying which may have affected its quality. In addition to such colophons, there are others indicating the material conditions of the scribe or the physical conditions of the copying. Thus, a German scribe did not hesitate to inscribe in the margins at the end of a manuscript containing Psalms, *Shir haYiḥud* and *Shir haKavod*, which he produced in 1420, a note saying that he was unable to proceed with his task since the money had run out.[195] This must have happened as the patron who commissioned the manuscript decided to cancel the order.[196] Another scribe, whose family hailed from Lyons, and who, before 1445, had copied a prayer book (according to the French rite) along with halakhic works, apologised for not copying all the components of the prayer book due to the cold winter weather: אני כותי׳ נחוץ, רגל אחד בפנים ורגל אחד בחוץ, אחד אצל האש

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193 Named after the German knight Rindfleisch, who incited the masses and led them.

194 The colophon was cited by S. Salfeld, Das Martyrologium des Nürenberger Memorbuches, Berlin 1898, pp. 29–58, and in B.Z. Dinur, A Documentary History of the Jewish People from its Beginning to the Present2, vol. 2, book 2, Tel-Aviv 1966, pp. 594-607 (in Hebrew). אברזוש, mentioned in the colophon, is a short form for Avraham; on fol. 225r the vocalizer-Masorete inscribed the name אברהם using characters formed by the micrographic rendering of Masora text.

The vocalizer-Masorete of a copy of Prophets that was completed in 1306 in France (the identification of the locality is uncertain) wrote a full colophon in a similar fashion, using very large characters made out of the Masora text, on the lower and upper margins of 14 folios of MS San Lorenzo de El Escorial, the Royal Library ms G-I-1 (F.J. del Barco del Barco, Catálogo de Manuscritos Hebreos de la Comunidad de Madrid, vol. 1, Madrid 2003, no. 11):

אני יצחק ב״ר מנחם הנקדן נקדתי ומסרתי הספר הזה אל הנכבד היקר ר׳ יהוד׳ יהוד׳ חסד בן יהוד׳ חסד וסימתיו בחמישי בשבת בשבעה ימים לחדש אייר בשנת חמשת אלפים וששים ושש לבריאת עולם בעיר פֿילַאוֹינָק היושבת במדינ׳ קיארצין המקום יזכהו להגות בו הוא ובניו ובני בניו עד סוף כל הדורות אמן אמן סלה וכן יהי רצון מלפני אלהינו אבינו רוכב בגאותו שחקים (fols. 380v-387r).

195 MS Vatican Vat. ebr. 27, fol 186v.

196 Although in the colophon inscribed by the scribe at the end of Psalms – constituting the major part of his copying – there is no mention that the copying was meant for another. Perhaps one should surmise that he had prepared it for a casual buyer who never materialized.

ואחד חוץ מאצל האש, ע"כ אין אני כות' הדברי' כאשר ה' צריכי' בשביל בלבול הקור בעז' הבורא

כשיבא הקיץ אכתוב מחזור אחר מסודר יותר מזה ואכתו' אותו על קלף.[197]

No need to cite in this context the many cases in which copyists claimed in their colophon that they had been following a corrupt or error-riddled exemplar. These were formulaic expressions intended as a conventional measure in the face of claims about inaccuracies in the copy. A small number of colophons convey fortright, key information about the conditions of the copying and the quality of the exemplar, as for example, MS Moscow, RSL, Guenzburg Collection 606, cited in the previous section, which scribe made a point of relating information concerning the copyist of the reliable exemplar he had used.[198] More testimonies in this matter are cited above, in chapter 1, section 4, n. 108. A more complex example is found in a colophon by the Karaite scholar Calev ben Eliyahu Afendopolo at the end of his copying of *Compendium of Ptolemy's Almagest* by Abu Maḥmmad Jabir ibn Aflaḥ, translated from Arabic into Hebrew by Yaʿaqov ben Machir. The scribe, who produced the manuscript in 1482 in Constantinople or nearby for his own use, disclosed some details not only about the exemplar he used as a forlage, but also about the copy from which his source had copied, which was the original manuscript of the translation:

תם ונשלם ספר אבו מחמד ג'אבר בן אפלח האשבילי על ידי לי <...> אשר העתיקו החכם ר' יעקב ב"ר מכיר נ"ע מלשון ערבי א<ל> לשון הקודש והגיהו החכם הגדול כ"ר שמואל ב"ר יהודה נ"ע בן משולם ב"ר יצחק ב"ר שלמה נ"ע המכונה מילש דמרשלייא. וזאת היא העתקה שנית כי אני העתקתי זה הספר מספר ר' שמואל ב"ר יהודה הנזכר שהיה הספר ההוא כתיבת ידו וזה החכם העתיקו מספר ר' יעקב ב"ר מכיר המעתיק[199] הנזכר שהיה התופש[200] הראשון כמו שהוא ידוע מדברי ר' שמואל המגיה הנזכר הספר הזה שכתב אחר השלמת הספר הזה.[201]

Illuminating information about copies of *Sefer Hapli'a* (a kabbalistic work) and their forlage was reported by an owner who had commissioned another Byzantine

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197 MS Parma Parm. 3009 (De-Rossi Catalogue 749), and see Richler & Beit-Arié Catalogue (Parma) 878.

198 Like the scribe of the aforementioned Moscow manuscript, so did another Ashkenazic scribe of a halakhic manuscript (Sefer Mordekhai, by Mordekhai ben Hillel) copied in Italy in 1418, write in his colophon: והעתקתי זה הספר מן מרדכי מדוייק ביותר אשר היה מדוקדק מפי מהר"ר שמואל שפירא ומפי החבר ר' בנייט דקבאלון (see Manuscrits médiévaux I, 83).

199 In medieval Hebrew, מעתיק equalled translator.

200 The commonest term in the Middle Ages for a copy or version in the sense of a manuscript that served as a model for copies was העתק. See above, chapter 1, in the text referenced by n. 107, and in the colophons cited below in chapter 13.

201 MS Paris Hébreu 1024 (see Manuscrits médiévaux. I, 148).

manuscript in Candia in 1462/3. In a note he inscribed in a cursive Ashkenazic script at the beginning of the manuscript,[202] copied for him in a Byzantine script, he remarked:

זה הספר הוא מועתק מספר הפליאה אשר הוא כולל מעשה המרכבה ואלו הטי׳ קונדריסים[203] הועתקו מפרשת בראשית לבדה ודע כי פרשת בראשית הוא ק״ך[204] ניירים לבדה אך כל התורה הוא כמו ת״ק נייריי[205] ו[א]יננו נמצא זה הספר בשום מקום ידוע רק בקונשטינא אשר ברומניאה ביד ר׳ יוסף בונפאצו.[206] כהיום שנת ה׳ אלפים רכ״ג ליצירה ובעת ההיא בא פה קנדיאה יהודי אחד ושמו ר׳ יעקב והביא העתק מפרשת בראשית לבדה ובררתי משם אלו הדברי׳ והעתיקם לי באלו הקונדרסים,[207] ור׳ מיכאל דומנו העתיק כל פרשת בראשית.[208]

Fascinating facts about the circumstances of the copying of an authored text can be found, for instance, in the colophon of one of the few manuscripts of *Kitsur Sefer Mitsvot Gadol*, by Avraham ben Ephraim. The colophon refers to a copy of this (unknown at the time) treatise brought to Ferrara in 1278, about a week before Passover, by a French scholar named Ya'aqov. That same Ya'aqov was on his way to Venice together with his son Donin, planning to sail by boat to Acre, and while in Ferrara he stayed at the home of 'Akiva ben Zecharia. The host appreciated the importance of the codex and wished to purchase it, but as its owner refused to sell he commissioned a copy, which was completed promptly, within a few days, during the week of Passover:

נשלם ספר המצות תהלה לשוכן ערבות <...> יפה פרי תואר קרא השם שמו להקימו על עמו, הנדיב ר׳ עקיבה בר׳ זכריה <...> להכתיב ספרים ולהעתיקם, המיישרים כל אורח מעוקל ולב מעוקם, והספר הזה הביאו תלמיד אחד בפיררא, ונתגורר עם ר׳ עקיבא בבית

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202 MS Vatican Vat. ebr. 187, fol. 3r.

203 Indeed, the manuscript comprises nine quires and contains only the first chapter of Genesis.

204 This refers to the number of folios - 120.

205 Namely, 500 folios.

206 This manuscript, known to its Candian patron as the only one containing the text of Sefer Hapli'a on the entire Pentateuch, still exists today as MS Vatican Vat. ebr. 195; it had been copied by an anonymous scribe who highlighted the name Yosef when it occurred in the text; no doubt he should be identified as Yosef Bonifacio, the copyist of the codex whom the Candian patron mentioned in his note, as ascertained by the comparison of his hand to that MS Vatican Vat. ebr. 220, copied by Yosef Bon Facio Ben Gershon. The manuscript contains 487 folios, like the approximate estimate of its patron in his note, see Richler & Beit-Arié Catalogue (Vatican)

207 Indeed, the name Ya'aqov was highlighted in the copied text.

208 The patron from Candia who commissioned the copy provided additional information, unrelated to the production of his copy: besides the full copying made by Yosef Bonifacio, the Bereshit portion (Genesis 1-6:8) of the rare Pentateuchal text was also copied by Michael Domano. The latter copied the entire Bereshit portion (which extends over 120 folios in the copy brought by Ya'aqov), and not only the part that the patron had selected to have copied by Ya'aqov (and indeed, MS Vatican Vat. ebr. 187 contains only 77 folios).

דירה, והוא צרפתי ור׳ יעקב שמו, ודונין בנו היה עמו, והגיע ביניגו בשבוע טרם חג המצות וכראות ר׳ עקיבא מעלת הספר והמליצות דבר לו אם היה חפץ במכירה ולא אבה מיד נשאו לבו לקורבה אל המלאכה לעשות בחיבה ובאהבה וכתב והכתיב הספר הנותן אמרי שפר בחולו של מועד נשלם שבח לאל עולם ואחר הפסח של שנת ל״ח לפרט הספר הועתק נחסל ונחרט והתלמיד נסע והלך עם בנו לדרכו ורכב אונייה בווניזיא לבשביל לעכו והשוע אשר הכתיבו בחריצותו ובהשתדלותו מבני בניו יזכו להגות בו כאוותו ויפרוש עליו האל סוכתו ושלומו לעד יעמוד זרעו ושמו מעתה ועד עולם בשם ה׳ אל עולם והמחק״ק אשר יגע וטרח לכותבו ולהעתיקו הספר אשר דבש וחלב לשונו ‹...› אמן אמן סלה.[209]

This chapter will not discuss testimonies held within colophons, pertaining to the modes of critical editing of copied texts, particularly texts critically copied by scholars for their own use, and shedding light on the modes of the transmission of texts in Hebrew characters. This topic has already been alluded to in chapter 1, section 5: on the singularity of Hebrew book production. It will be elaborated upon in chapter 13 below.

7. **The duration of copying and its pace**

More than two hundred and fifty colophons contain information concerning the duration of copying, shedding additional light on the rather obscure craft of medieval Hebrew book production and on the output of scribes.[210] This kind of information is communicated in two ways: the direct and explicit one, or the indirect and implicit one.[211] Employing the less common but sounder direct mode, copyists explicitly stated

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209 MS Parma Parm. 1941 (De-Rossi Catalogue 813), fols. 153v-154r.This halakhic collection contains several codicological units, of which Kitsur sefer mitsvot gadol is one (see Richler & Beit-Arié Catalogue [Parma] 876). According to the colophon it was copied by מחק״ק – a pen name adopted by the renowned scribe Avraham ben Yom Tov haCohen, which he used for recording his name in four of the eight manuscripts he copied; see M. Beit-Arié, 'The Cryptic Name of the Scribe Avraham b. Yom Tov HaCohen', Israel Oriental Studies, 2 (1972), pp. 51–56; Idem, 'Nosafot la-ma'atiq Avraham b. Yom Tov HaCohen', Kiryat Sefer, 56 (1981), pp. 546-547 (in Hebrew). [=Mi-ginze ha-Makhon le-Tatslumei Kitvei ha-Yad ha'Ivriyim, ed. A. David, Jerusalem 1995, p. 130-131]. There is no doubt that the manuscript in question was not copied by Avraham ben Yom Tov, who was, however, active in Rome at the time (according to the sole mention of locality): it was inscribed around the year 1400 in a Sefardic, not an Italian, script. Hence the colophon in question is a late copy of the original colophon.
210 A number of examples were mentioned by Steinschneider, Vorlesungen, p. 50.
211 On the speed of copying and daily output of Latin copyists, see J.P. Gumbert, 'The Speed of Scribes', in Scribi e colofoni: Le sottoscrizioni di copisti dalle origini all'avvento della stampa – Atti del seminario di Erice, X Colloquio del Comité international de paléographie latine (23–28 ottobre 1993), ed. E. Condello & G. De Gregorio, Spoleto 1995 (Biblioteca del Centro per il collegamento degli studi medievali e umanistici in Umbria 14), pp. 57–69, which surveys earlier studies and discussions, and see also J. Vezin, 'L'emploi du temps d'un copiste au XIe siècle', ibid., pp. 71–79. Gumbert also classifies the testimonies contained in manuscripts' colophons (excluding information about desired or required

how long they took to complete the copying: for instance forty four weeks (מ״ד שבועות), as related by Simḥa HaSofer ben Yehuda HaSofer of Nuremberg, the professional scribe of the monumental illustrated maḥzor known as the Worms Maḥzor, copied in 1272, apparently in Würzburg.[212] The Italian scribe Menaḥem ben Binyamin,[213] active during the last quarter of the thirteenth century, who copied a number of manuscripts for his own use, prided himself on the speedy pace of his copying and often mentioned the duration of his work - either explicitly or indirectly.[214] In the two colophons of a codex he copied in 1289 he noted:[215]

נשלם הספר ביד מ״יי בב״יל⁶¹² בחמישי בשיני לחמישי⁷¹² להמ״ט ובשבעה ימים נכתב ונגמר כולו תהלה לאל העוזר הנותן כח לעשות חיל >...< והבא אחריי הממאן להאמין אל יתמה בזה כי כך דרכי לכתוב בנחיצות עם יד אלהי הטובה עליי ואעידה לי עדים נאמנים את בני דורי אשר ראו ושמעו את דברי כי גם הם תמהו בזה ואלולי שראו לא האמינו (fol. 140r)

נשלם הספר הזה ברביעי לחמישי לעשרים ושנים218 להמ״יט תהלת האל יתעלה על יד מנחם ישל״ים בר׳ בנימן לעיי״ץ ובשמונה ימים נגמר כולו תהלה לאל העוזר >...< (fol. 298r)

In order to calculate his particular (self-professed) output, not only must we take into account his testimony regarding the number of work days and the number of folios he

outputs, e.g. in contracts, which are not to be found in Jewish sources) into two types – direct evidence and indirect evidence in multi-unit dating.

212 MS Jeruslaem Heb. 4° 781/1, see Manuscrits médiévaux. I, 7; and see the colophon inside the Worms Maḥzor, facsimile volume, fol. 34v and the digitized manuscript in the NLI website.

213 See above, n. 63.

214 See in detail, M. Dukan, 'Menahem b. Benjamin, scribe et savant juif italien de la fin du XIIIème siècle', Italia – Studi e ricerche sulla cultura e sulla letteratura degli ebrei d'Italia, IX/1–2 (1990), pp. 19–61.

215 MS Cambridge Add. 173.

216 For the acronym of his name, which includes blessing formulas that were unique to him, see above, n. 63.

217 The annotation of the day of the week, the day of the month and the month in this manner – here indicating Thursday, the 2nd of the 5th month, i.e. of the month of Av (in 1288/9) is known to us from Italian colophons that have survived from the second half of the 13th century. Later, this pattern in colophons would become extremely rare (its only occurrence in the 14th century was in the cryptic colophon mentioned above in n. 159). In the 15th century a few Italian copyists resumed the indication of the month with an ordinal number (according to this method, Nissan would of course be the first month).

218 The second colophon too indicates the date according to the pattern described in the previous note, although it seems that the copyist erred slightly and placed the month before the day in the month. The order of elements here is the day of the week ('the fourth'), the month ('the fifth'), and the day of the month ('the twenty-second'). His confusion is apparent there in his handwriting as well.

produced (the first 140 in seven days, i.e. twenty folios - or forty pages - per day, and another 158 folios, in eight days, i.e. at an identical pace), but other crucial factors as well, some contradictory, which may well balance each other out. First, the dimensions of the written area and the number of lines it contained, and, most important – the average number of written signs per line; this quantitative datum, when multiplied by the number of lines, may serve a convenient means for comparing copies which written areas show different dimensions (the graphic signs including spaces between words, as in the modern day practice of counting printed characters, were counted for five consecutive lines in each manuscript documented in SfarData). In addition, one must take into consideration not only the type of script but particularly its mode - which determines the number of strokes required to inscribe the letters,[219] as well as its style, quality of execution, size, and esthetic design – all factors that crucially affect the speed of writing. Moreover, the genre copied must have had an effect on the output: the copying of a continuous homogeneous text differs from the copying of a maḥzor comprised of multiple components, rendered in a wide array of script sizes, or from that of a multi-layered halakhic corpus, interspersed with glosses, or from that of a core text surrounded by marginal commentaries which had been tailored to accord with it. Similarly, the speed of copying would be conditioned by the degree of investment in para-scriptural elements used by the copyist to improve text readability[220] or to achieve a uniform length of the lines,[221] both of which might require intricate ploys and hold back the pace of copying. It goes without saying that while analyzing the information about the speed of copying one must distinguish between manuscripts that had been commissioned and copied uncritically by hired scribes - professional or casual, and copies produced by learned individuals who reproduced the text critically for their own use.

The manuscript copied by Menaḥem ben Binyamin is of small dimensions (written area of 141×91-96 mm); it was inscribed in a current semi-cursive script, which - for the time of its production - could also be defined as a relatively minute cursive.[222] For the

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219 Namely, whether square, semi-cursive, or cursive; see below, chapter 11, in the section entitled 'The three modes of rendering the Hebrew script'.
220 See below, chapter 8.
221 See below, chapter 7.
222 For the modes of medieval Hebrew book-scripts, their types, and historical evolution, see below, chapter 11.

sake of comparison, the dimensions of the written area in the monumental Worms Maḥzor are 303×211 mm, and its script is a large square Ashkenazic, reminiscent of the Gothic style, which required more pen strokes, including decorative elements, to produce the characters. We do not know exactly how many folios the Worms Maḥzor held since only one of its volumes, containing 219 folios, has survived; in a fair estimate it would have included around 400 folios. If this were so, the pace of copying would have been no more than two folios a day. Despite the large dimensions of its folios the number of characters per page is smaller than that displayed in Menaḥem ben Binyamin's small-sized manuscript. At the same time, Menaḥem's script mode required a lesser time investment.

In another manuscript[223] he copied during the years 1287-1288, Menaḥem inscribed colophons at the end of both its two units, where he documented the number of days needed for the copying:

חסלת פירוש סדר זרעים אשר פירש מרינו ורבינו יצחק הרב המובהק נר״ו בן הרב המובהק מלכי
צדק נ״ע. ביד מנחם בר׳ בנימן ובליל ד׳ ט׳ ימים לירח הראשון הוא חודש ניסן שנת ה׳ אלפים
ומ״ז לפרט <1287> ותהלה אתן לאלהי ישראל שעזרני לכתבו בנחיצות ובמהרה כאשר היה צריך
כי נכתב כולו מראש פיאה עד הנה בו׳ ימים וחצי (fol. 170r)

נשלם הספר הזה בחצי יום חמישי כ״ד לחודש השלישי שמ״ח <שנת מ״ח / 1288>. ונכתב מראש
הספר עד הנה דהיינו כל פי׳ מסכת ברכות בארבעה ימים ושליש תהלה לאלהי ישי׳ שחיזק ידיי
ואימץ זרועותיי הוא יזכה אותי מ״יי בב״ל וזרעי וזרע זרעי להגות בהם (fol. 1r)

The second colophon relates to a part of the manuscript copied more than a year later, but that part having been lost, one is unable to calculate the scribe's output for this section. In any event, the 1287 colophon reveals that Menaḥem's output increased to as much as 26 folios per day. This increase can be explained by the even smaller dimensions of the written area, 106×84 mm.[224]

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223 MS London Or. 6712.

224 Another example of this scribe's predilection for detailing the number of days he devoted to copying is MS Parma Parm. 2784 (De-Rossi Catalogue 1390), a collection of Kabbalistic works copied in 1286-1287 (it is missing ten quires at the beginning, some of which have been identified by Daniel Abrams in MS New York MS 8124 (according to M. Idel, R. Menaḥem Reqanaṭi hamequbal, Jerusalem-Tel Aviv 1998, pp. 45-46 [in Hebrew]). In the only manuscript that Menaḥem copied not for his own use he inscribed six colophons. In one of them he noted that he had copied that portion in '24 nights, and a bit more' (fol. 24r). Even when we take into account the missing folios, it seems that his output at night time was meager – some 5 folios per night. This very low speed of copying relative to his other manuscripts

In a computation of the number of signs copied daily, which further demonstrates Menaḥem ben Binyamin's output, we see that in the first manuscript he copied an average of 42,640 signs per day, and in the second - 64,646 signs per day. Such speed of copying is open to serious doubt, when compared not only to the average speed of Latin copyists, but even to their aberrant outputs. According to Gumbert's study,[225] based on a corpus of 800 manuscripts which contain direct or indirect evidence on the pace of copying, the average output of a medieval copyist was a mere 2-3 pages per day, with no marked differences between different zones and periods. Relying on the catalogues of dated manuscripts as his source Gumbert could not calculate the number of graphic characters, which would, certainly be a more reliable measuring tool (especially when comparing the same mode of script) than the number of folios; this said, he also sorted his manuscripts according to their height and found that the abovementioned average pertained to manuscripts up to 20 centimeters tall (similar to the manuscripts copied by Menaḥem ben Binyamin). Moreover, he examined the effect of the script mode on the speed of copying and concluded that when formal scripts were used the limit was an average of one folio a day, and with more cursive scripts – two folios a day, whereas using the cursive Humanist script produced an average output of 3.5 folios a day.[226]

These doubts are further reinforced by data reported by another Italian copyist who copied for himself (but also for others) and explicitly mentioned the pace of his copying three times, in two manuscripts. That scribe, Menaḥem (צמ״ח) ben Avraham (יעק״ב) ben Binyamin ben Yeḥi'el, had been active in Rome and its vicinity between 1319 and 1326. He too, like Menaḥem ben Binyamin, used a current semi-cursive, yet smaller and even minute, with which one would naturally expect a larger output. His testimony is contained in the colophon of a manuscript bound in three volumes and containing a

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should be ascribed primarily to the much larger writing area (168x108 mm), as well as to nocturnal copying, which was obviously less speedy than in daytime; also the fact that the manuscript had been copied for his teacher and not for his own use perhaps explains the slower pace. On other colophons and the segments by other copyists in the manuscript, see Richler & Beit-Arié Catalogue (Parma), 1191.

225 Above, n. 211.

226 In the regulations and contracts between the universities of Paris and Bologna and the scribes employed to copy texts for students according to the pecia system, smaller outputs were stipulated: 0.57 folios per day was the minimum output permitted by the University of Paris while and at the University of Bologna the standard output was 32-40 folios per month; see Gumbert, 'The Speed of Scribes', (above, n. 211), pp. 65-66. As examples of deviations from the average of two folios per day, he cites cases of outputs of more than five folios per day in coarse scripts, or cursive - especially Humanist - scripts (ibid., pp. 66-68).

collection of biblical commentaries that he copied in Rome in 1323 for his own use.[227] The total number of written folios is 232, the written area dimensions being 228×176 mm; in other words, the codex layout is larger than those of the codices produced by Menaḥem ben Binyamin, yet his script is smaller and more condensed and the number of lines per page is 51-52. At the end of his final colophon, he spelt out the duration of entire copying (four months and six days), sealing it with a restricting note:

בשיני בשבת בי״ח לחודש סיון בשנת חמשת אלפים ושמונים ושלשה לבריאת עולם השלמתי זה הפירוש {מכל המקרא?}[228], וכתבתי אותו אני מנחם צמ״ח בר׳ אברהם הרופא זצ״ל ברבי בנימן תנצב״ה בר׳ יחיאל ע״ה. וכתבתי אותו ברומא עיר הגדולה בד׳ חודשים וו׳ ימים השם ברחמיו שזיכני לכותבו הוא יזכיני לשמור ולעשות את כל מצותיו אמן ואמן סלה ועד ושלום אמן. אילו הפירושים שכתבתי הנה : בחומש – הפירוש חומש הארוך לר׳ אברהם אבן עזרא, {בְּנֵֿבִיֿאִֿיֿםֹ   } <...> [229] והוא בשני כרכים. בכרך אחד כת׳<בתי> פירו׳ {נביאים?}[230] ודברי הימים וכת׳<בתי> אותם בד׳ לחודש׳ וו׳ ימים לבד השבתות וימים טובים.[231]

This exceptional yet obvious note according to which one should substract Sabbaths and holidays, in which writing was prohibited,, from the full duration of the copying illustrates the difficulty in attempting to calculate copying outputs in the Middle Ages, since we are uninformed as to whether the copying was carried out unintermittedly, day in and day out, and as to the number of daily or weekly hours consecrated to it.[232] The

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227 MS Parma Parm. 3099, 3126, 3118 (Richler & Beit-Arié Catalogue [Parma] 677). See also Manuscrits médiévaux II, 20, and the explanations there of the seemingly double names of the copyist and his father.

228 These words appear to have been erased and rewritten by another hand.

229 Two erased lines, the first word of which is still legible.

230 Apparently erased.

231 MS Parma Parm. 3099, fol. 58v.

232 Menaḥem ben Binyamin's records of his swift copying pace refer to short periods, several days or even parts of days. Hence he must have worked regularly and uninterruptedly. We have only one testimony about the regular output of a hired scribe, but it appears in an early 16th century chronicle and not in a colophon. Eliyahu Capsali, in his Sipurei Venetsia which he wrote during his sojourn in Venice in 1508-1515, relates that Yosef Castel Franco, who established a yeshiva in Brescia, Lombardy, hired a scribe to copy on parchment all of the Talmudic tractates with Rashi's commentary and the Tosafot, a project that was never completed (see above, chapter 1, n. 133). Capsali details the fee and work hours of that scribe: וישכור את ר׳ פרץ הסופר לכותבם לו ולתת לו לשכרו בשנה פרחים לי״ז ומזונותיו, ולכתוב לו ביום שעות ח׳ <ז׳>, וביום ו׳ <ה׳> שעות ד (in Seder Eliyahu Zuta, ed. M. Benayahu, S. Simonsohn, and A. Smuelevitz, vol. 2, Jerusalem 1977, pp. 258 [in Hebrew]). The figures in the angle brackets denote the number of hours cited by N. Porges from another version in JQR, 79 (1924), pp. 44-45. Thus scribe was expected to work eight hours a day, except for Fridays, on which he worked only four hours, i.e. 44

answers to these questions varied, depending on whether the work was performed by hired scribes or was user-produced, in which case the copyists would have less time on their hands; and yet, Menaḥem ben Binyamin's fantastic output seems to disprove this assumption. The daily output of Menaḥem ben Avraham in MS Parma may be calculated by counting his graphic signs. Since the date of completion of the manuscript was 18th of Sivan, the Sabbaths and holidays (Purim, Passover [including Passover week] and Shavuʿot) that occurred in the year 5083 must be subtracted from four months and six days, leaving 96 days for the copying of 232 folios, namely the copying of a daily average of 2.5. Since each page contains an average of 6,550 graphic signs, his average output was 16,375 signs per day. If we assume that the eves of the Sabbaths and holidays should be counted as half workdays, another ten days must be subtracted from the total, leaving us with 86 days. According to this calculation he would copy an average of 2.7 folios per day, i.e. 17,685 signs. This output by Menaḥem ben Avraham is very much smaller than that of Menaḥem ben Binyamin, as testified in his colophons. Even if we could infer from the wording of Menaḥem ben Avraham's final colophon that he had copied another volume with commentaries to Prophets and to Chronicles - although this information was scraped off the colophon - his working pace would not equal that claimed by Menaḥem ben Binyamin. Given the doubt regarding the full extent of the Parma manuscripts copied by Menaḥem ben Avraham, the fact that he noted in the colophon of the first part of the manuscript, which contains Ibn Ezra's commentary on the Pentateuch and extends over 83 folios, that he had completed it in 20 days,[233] allows us to verify the information of the final colophon. Presumably, at least two Sabbath days and two half days on the eves of those Sabbaths should be subtracted from this figure; consequently his output would have been nearly twice that calculated according to the final colophon (4.9 folios per day, 32,095 graphic signs). This figure supports the hypothesis that Menaḥem ben Avraham had indeed included the commentaries to the Prophets and Chronicles in the total duration of copying.

Indeed, in another manuscript copied by Menaḥem ben Avraham for his own use a few months after the completion of MS Parma (MS Roma, Bib. Angelica Or. 72, an oversize manuscript [454×322 mm]) he inscribed a colophon at the end of the grammatical

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weekly hours (according to the other version he did not work on Fridays and his weekly quota was 39 hours).
233 MS Parma Parm. 3118, fol. 84v.

section of *Sefer Hamikhlol* by David Kimḥi comprised in that manuscript, where again he noted the duration of the copying, thus allowing us to re-confirm or settle the earlier contradictory data:

נשלם חלק הדקדוק על ידי מנחם צמ״ח ביר׳ אברהם יעק״ב בשנת חמשת אלפים ופ״ד לבריאת עולם בחודש מרחשון וכתבתי אותו בי״ד ימים. השם שזיכני לכותבו הוא יזכני לשמור ולעשות את כל מצותיו אמן ואמן סלה ועד (fol. 340v)[234]

This section occupies fol. 326v to fol. 340v; two Sabbaths and Sabbath eves must be subtracted from the total of fourteen days noted as the duration of the copying, and hence it emerges that this Menaḥem had copied an average of 1.3 folios per day only; and yet these are large format folios, each containing 92 lines of dense script! The pages are comprised of two columns, each containing an average of 72 graphic signs per line, which makes 144 signs per line per page, and 288 per line across the four columns of each folio, namely a total of approximately 26,500 signs per folio. Hence the scribe's average daily output would have been 34,450 graphic signs. This calculation comes close to the figures derived from the data in the colophon of the first part of MS Parma, thus validating the possibility that indeed, the figures appearing at the end of the MS Parma included also the volume that did not survive. This appears to reinforce our doubts regarding the figures provided by Menaḥem ben Binyamin, whose mode was less current than that of Menaḥem ben Avraham.

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234 This codex is complicated in terms of the book's archaeology. It is in fact composed of two manuscripts bound not according to their date of production. On fols. 6-293 (fol. 293 was left blank) a scribe copied Minor Prophets and Hagiographa in the centre of the page in a square Sefardic script, while alongside the Prophets, the columns of the Aramaic translation were inscribed in a small square script of the same type. The name of the copyist was evidently Yitsḥaq (according to the highlighting of this name in the biblical text). On the margins of the pages many commentaries were copied by Menaḥem ben Avraham, most of them in a minute current semi-cursive Italian script, in Frascati in 1326. Fols. 294-343 were inscribed by Menaḥem only, in 1323, and comprise grammatical works in two columns on the entire page and in the same minute script found in the margins of the later manuscript. According to the inscription on fol. 7r, Pope Leo X (of the House of Medici) presented the manuscript as a gift to the Hebraist and Christian Kabbala scholar Egidio da Viterbo. According to his title in the dedication this took place before Egidio was appointed cardinal (July 1, 1517), while he was still acting as 'General' of the Augustinian order. On Egidio's interest in Hebrew literature and his determination to acquire Hebrew books see M. Beit-Arié, 'Eliyahu Levita as a Scribe, Author Scribe and Codicologist' (a paper read at a conference held in the Oxford Centre for Hebrew and Jewish Studies, Yarnton Manor, 17–18 December 2007, which Proceedings are unpublished. The article is accessible on the website academia.edu).

A variant for directly reporting the duration of the copying was practiced by some copyists, who would indicate the precise dates of the beginning and completion of the copying instead of summing up the number of work days. One of them, the scribe and vocalizer Qerashavyahu ben Yitsḥaq, noted in a rhymed colophon he wrote in France in 1242-1243:

ויהי ביום השמיני לחדש אב חורבני שנת מנין השני לפרט אלף ששי הוא החדש החמישי החלותי אני קרשביהו הנקדני את הספר מימוני וביום החדש השני בשני לאדר השני לגמר וסוף הביאני וקץ ותכלה הראני יוצרי וקוני וה׳ עזרני[235]

Another example, from Spain, appears in a colophon of *Sefer he'Arukh*, inscribed in 1284-1285 in the fortress of Seia by a hired scribe in square Sefardic script:

וכתבתיהו וידי נטפו מור, ותבענה שפתי שיר ומזמור, כאילו יחזה <!> עיני בסיני, ואזני ישמעו זכור ושמור, בחדש ניסן שנת מ״ד התחלתי בעזרת יה וסיימתי בחדש אייר בשנת מ״ה השניה.[236]

An indirect mode for working out copyists' pace and their outputs is used in multi-colophoned manuscripts that do not contain an explicit indication of the duration of the copying. In many of the multi-text or multi-section codices the copyist would inscribe a colophon at the end of each textual unit, or textual units. Manuscripts containing at least two colophons with detailed dates allow us to calculate the time span between their dates and the number of folios inscribed in-between. Clearly, our uncertainties concerning the scribes regular copying and work hours hamper our ability to extract quantitative conclusions from the testimonies of colophons that explicitly state the duration of the copying; all the more so when indirect evidences are concerned. There

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235 MS Cambridge Add. 1564 (8), fol. 316v. The copyist began his copying on the 8th of Av 5002 (1242) – שנת מנין השני לפרט אלף ששי – and ended it on the 2nd of the second Adar (in a leap year). He did not indicate the year in which the copying was completed, but obviously meant the second Adar in the year that followed, namely in 5002 (1243). The meaning of the formulation ביום החדש השני is unclear. Nahum Golb believes this can be understood as the second day of the week, and according to the date, which falls on a Tuesday, he proposes that the copying was completed on Monday night (see N. Golb, Toledot hayehudim ba-'ir Rouen biyemei habeinayim, Tel Aviv 1976, p. 152, n. 435 [in Hebrew]). The attribution by Golb of other manuscripts to קרשביהו (ibid., p. 129, 157, and cf. p. ix) is unfounded. The only feature common to them and this manuscript is the script type, but they were undoubtedly inscribed by different hands as clearly demonstrated by the para-scriptural characteristics.
236 MS Munich Cod. hebr. 142, fol. 195v.

is no way of knowing if copyists continued with a new text immediately upon terminating a textual unit (ending with a colophon) or whether there would be a brief or lengthier break in the copying.

The following are two illustrative examples: a scholar who copied for his own use in Tlemçen, Algeria in 1455-1456 a copy of the Aramaic translation to Hagiographa, which comprised of 120 written folios only, inscribed eight colophons with precise dates – one colophon at the end of each book of Hagiographa (except one).[237] MS St. Petersburg Евр.-Араб. I 11 contains large fragments from the eight volumes of the Karaite Yefet ben 'Eli's long commentary in Judaeo-Arabic on the portions of the Pentateuch (the books of Genesis, Exodus, and Leviticus; the commentary includes the verses of the biblical text in a large square script). It was copied in the Middle East[238] by one scribe, apparently for his own use, in the course of fourteen years, 1353-1367. Among the 1305 folios remaining from this vast copying enterprise sixteen colophons have survived (all in Judaeo-Arabic), of which nine, from the years 1357-1359, are consecutive. Another two manuscripts kept in the same library undoubtedly belong to the same copying project, as attested by the dimensions of the written area as well as by their dates, and two colophons have survived in them.[239]

8. Blessings

Nearly every colophon contains blessings bestowed upon the manuscript's owner; blessings would be bestowed upon the copyist himself when copying for his own use, and even when copying for another. These blessings and well-wishes are not only a basic component of the colophon, but often the most sizeable too, sometimes comprising around half of the entire colophon. As with other components, such as honorifics, blessings are characterised by conventional patterns and formulas, yet they

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237 MS Paris Hébreu 110, see Manuscrits médiévaux, I, 108, where all the colophons are shown, and see ibid. information about the copyist Natan Sholal.

238 This same scribe, with the amazingly long genealogy (אברהם הרופא בן משה בן שמואל בן יקר בן משה בן שלמה בן אהרן בן שלמה בן אהרן בן ישראל הלוים בני הצכני) continued to copy the commentary for the weekly portions of the Book of Numbers. In 1373, he copied some of the weekly portions of the same book in an identical format in Jerusalem (see Manuscrits médiévaux I, 70).

239 One of these is MS St. Petersburg Евр.-Араб. I 564, copied in 1366, which contains a weekly portion from Leviticus; the other – MS St. Petersburg Евр.-Араб. I 117 – is simply a colophon from 1358 that survived from a weekly portion of Genesis.

On the calculation of the pace of copying of the sumptuous Rothschild miscellany, kept at the Israel Museum, MS 180/51 (see Beit-Arié, Makings, pp. 181-215), see B. Elizur, 'Dating of the Rothschild Miscellany', Tarbiz, 66 (1996/7), p. 277, n. 22 (in Hebrew). Elizur concluded that the scribe produced an average of half a folio (i.e. one page) a day.

do not display an equal share of diversity. In early colophons from the Orient the formulation of blessings was still free and gave expression to the linguistic talents and aspirations of the scribe. The scribe of the biblical MS Cairo (copied allegedly by Moshe ben Asher in Tiberias, 894/5, but in all likeliness dating from a century later)[240] thus concluded the second colophon dedicated to the patron who commissioned the manuscript:

זה הדיפתר מה שזכה יעבץ בן שלמה הבבלי נח נפש <...> ויזכהו <ה'> להגות בו ולנצור ולשמור כל דבר שיש בו ויתן לו חלק טוב ולב טוב וגורל נעים בעולם הזה ושכר טוב לעולם הבא ויזכה יעבץ בן שלמה נוח נפש לחזות בנעם ה' ולבקר בהיכלו ויתן לו אלהי ישראל בנים ובני בנים הוגים בתורה ועסוקים במצוות וכל הברכות הכלולות בתורה ובנב'<יאים> ובכתובים יחולו על ראשו ועל זרעו וכל ישראל בכלל ברכה אמן[241]

In later periods too, some copyists formulated the blessings freely, employing whatever phrases suited their fancy; this said, many of the formulas – in nearly half of the colophons – wish upon the owner (or upon the scribe himself) as well as upon his sons and grandsons that they be granted the right and privilege to study the book (and other books); some would add the wish that the book be bequeathed to the owner's descendants. Around half of these formulas are based on the verse from Joshua 1:8 'This book of the law shall not depart out of thy mouth; but thou shalt meditate therein day and night, that thou mayest observe to do according to all that is written therein: for then thou shalt make thy way prosperous, and then thou shalt have good success' (לא ימוש ספר התורה הזה מפיך והגית בו יומם ולילה למען תשמור לעשות ככל הכתוב בו כי אז תצליח את דרכיך ואז תשכיל). The citing of this verse would be only natural in colophons

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240 On the doubts regarding the authenticity of the earliest dated colophon in this manuscript, see above, chapter 1, section 4: 'Extant manuscripts'.

241 Codices hebraicis, Part I, Manuscrit 1. Cf. the rhymed colophon dedicated to the owner of MS St. Petersburg Евр. I B 3, inscribed in 916 (Codices hebraicis, Part I, Manuscrit 3). The colophon invokes God to shower copious blessings on the owner in this world and in the world to come: נחשא טבא סימנא מעליא. יהיה זה המצחף לרבנא <...> ועל גזעו <...> ואל שדי יברכם וישמרם ויזכם להגות וללמוד ולעשות ולקיים כל מצות כדי שיירשו שני עולמים ויתן להם שכר תמימים : חבלים להפיל לו בנעימים : כבוד ועשר ועוז ותעצומים : מתוק לנפש ומרפא לעצמים : ברכות תהומים ושפע ימים : נטות חסד ולשאת רחמים : ידים להגביר בעורף מתקוממים : הם בשפל ולתתו במרומים : ובטוב לבלות ארך ימים : דברים טובים דברים ניחומים : הנחלת טובות שני עולמים : <...> לחיים שניהם נרשמים : בספר זכרון עם יראים ותמימים : כ"כ אז נדברו יראי ה' איש אל רעהו ויקשב ה' וישמע ויכתב בספר זכרון לפניו ליראי ה' ולחשבי שמו : גיל יגיל אבי צדיק ויולד חכם ושמח בו : כל הברכות בתורה והאמורות בכתובים והעתידות והנחמות והרשומות בנביאים האחרונים בפי כל נביא וחוזה יתקימו ויתדבקו על רבנא <...> בנו אמן : ועל כל אהבי תורה אמן ואמן נצח סלה ועד.

See also the first colophon in the renowned "Codex Leningrad" (Codices hebraicis, Part I, Manuscrit. 17), the earliest extant complete biblical codex (Cairo, 1008), which blessing formulas are too lengthy to cite here.

inscribed in biblical manuscripts, yet it was more frequent in non-biblical texts, and became a conventional formula. In the Ashkenazic zone, as well as in the Orient, this verse was not often cited. The citation of the verse from Joshua was sometimes accompanied or followed by a citation from another related verse, Isaiah 59:21: "As for me, this is my covenant with them, saith the Lord; My spirit that is upon thee, and my words which I have put in thy mouth, shall not depart out of thy mouth, nor out of the mouth of thy seed, nor out of the mouth of thy seed's seed, saith the Lord, from henceforth and forever" (ואני זאת בריתי אותם אמר ה׳ רוחי אשר עליך ודברי אשר שמתי בפיך לא ימושו מפיך ומפי זרעך ומפי זרע זרעך אמר ה׳ מעתה ועד עולם). Neither the combined form nor the substitute were common: they occurred chiefly in Spain and to a lesser degree in Italy, and even less so in Byzantium and in the Orient; yet the earliest occurrence was in an Oriental manuscript dated 929.[242] The blessing formula wishing that one should be allowed to study the copied book (with or without the verse) was no substitute for the verbose blessings and wishes that copyists included in their colophons, and it usually appears at the colophon's conclusion.

One among these wish formulas is distinctive in that the wish is self-addressed by the copyist, and is found fairly often in Italian colophons only, usually at their conclusion: וחלקי המחוקק יהיה ספון עם מצדיקי הרבים ככוכבים לעולם ועד. The formula is a conflation of two verses והמשכילים יזהרו כזהר הרקיע (Deut. 33:21) and כי שם חלקת מחקק ספון ומצדיקי הרבים ככוכבים לעולם ועד (Dan. 12:3). A likely hypothesis is that the formula had been coined by the renowned scribe Avraham ben Yom Tov HaCohen, who referred to himself as מחק״ק – based on the gematria of his name.[243] Indeed, he is the first to have used this formula (in 1285), always strict in observing the spelling המחקק with the defective orthography as it appears in the Bible - and sometimes marked as an acronym - while those who followed this practice would spell המחוקק with the plene orthography.[244] This may exemplify how a personal formula became common practice, and we may assume that, likewise, all formulas had initially been a personal habit, gradually adopted by contemporaries and then disseminated in subsequent generations.

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242 Codices hebraicis, Part I, Manuscrit. 5.

243 See above, n. 209.

244 Likewise, when first using the formula in MS Parma Parm. 2460 (De-Rossi Catalogue 221), he did not write וחלקי but וחלקת המחקק, while in the 1289/90 colophon he wrote וחלק המחק״ק (MS Oxford MS Mich. 533, Neubauer Catalogue 173). Indeed, the form וחלק remained in all the early manuscripts whenever the copyists adopted the formula, and only in mid-14th century did the form וחלקי substitute it.

The formula יהא סימן טוב על מריה is encountered repeatedly only in Yemen, in about one quarter of the manuscripts. And particularly in Yemen, but in other countries in the Orient as well, scribes begged forgiveness for errors that might be found in their copying, citing the verse in Psalms 19:13 in which the psalmist beseeches God to cleanse him from hidden errors and faults.

Worthy of comment are conventional wordings and expressions which appear in colophons and yet are unrelated to names or to well-wishing formulas, such as the coined phrases at the opening of the colophons of Italian manuscripts, which display of formulas is richer than in other manuscripts. Dozens of Italian colophons open with the phrase ותכל מלאכת עבודת הקודש.[245] In Oriental manuscripts of the tenth century and to a lesser degree in the following centuries, colophons would begin with the formula 'I, so-and-so son of so-and-so'. This pattern was quite prevalent in colophons, especially early ones, inscribed in the zones of Sefardic culture, as well as in the zones of northern France and the German lands. In the numerous colophons from the Middle East written in Judaeo-Arabic, inscribed mostly by Karaite scribes and comprising more than half of the total number of colophons, the use of patterns and formulas is quite salient. Presumably, these formulas must have been common in Arabic manuscripts, which show more regularity than the Hebrew ones.

9. Scribal formulas: at the end of the copy, at its beginning, and in the margins

Blessings upon the completion of the copying

In addition to the blessings and expressions of meekness appended to names in the colophons, and besides the coined phrases reviewed above, other scribal formulas – added to the text itself - can be detected.[246] The first kind includes expressions of praise once the manuscript had been completed. These were most common in all zones since

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245 In early colophons which adopted this formula, during the 13th and early-14th centuries, it does not appear in full.

246 See Steinschneider, Vorlesungen, pp. 47-49; Berliner, 'Ein Gang', pp. 93-96. In his study of Latin colophon formulas, Lucien Reynhout (L. Reynhout, Formules latines de colophons, vols. 1–2 [Bibliologia 25], Turnhout 2006) assembled and analysed 29 ending formulas and their variants based on 24,000 occurrences in the large corpus of colophons in Western manuscripts (Bénédictins du Bouveret, Colophons de manuscrits occidentaux des origines au XVIe siècle, vols. 1–6, Fribourg [Switzerland], 1965–1982). In his book (vol. 1, pp. 22-23), Reynhout proposes criteria to determine what qualifies as a formula, chiefly – the occurrence of a typical sequence of words and its employment by numerous copyists.

the earliest codices, and they appear in almost sixty percent of all dated manuscripts. Moreover, many copyists inscribed several formulas marking the completion of copying. These were inscribed adjacent to the colophon, before or after it; sometimes they would be incorporated in it or attached to it. Indeed, in many printed catalogues these were considered part of the colophon although inscribed separately, and they would usually be printed as part of the colophon. The ending formulas show greater uniformity and are less varied than other scribal formulas. Many are inscribed in acronyms, while some are characteristic or specific to a certain region. As is the case with other scribal formulas, the ending formulas in Italian manuscripts are distinct in their uniqueness.

כבודך ה׳ – An Italian formula of ungrammatical, truncated phrasing, so foreign to the Hebrew language that Steinschneider had suggested already in the late-nineteenth century that it had certainly derived from a foreign language.[247] Indeed, similar formulas were common in Latin manuscripts in Italy.[248] This ending formula, usually inscribed after the colophon, was used

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247 Steinschneider, Vorlesungen, p. 47.

248 The following are a few ending formulas cited by Albert Derolez from colophons of humanistic scribes: Deo laus et honor; Deo laus, honor et gloria; Deo laus, honor, imperium et Gloria, see. A. Derolez, 'Observations on the Colophons of Humanistic Scribes in Fifteenth-Century Italy', in Paléographie 1981: Colloquium de Comité International de Paléographie, Munich 15–18 September 1981, ed. G. Silagi (Münchener Beiträge zur Mediävistik und Renaissance-Forschung 32), Munich 1982, pp. 255–257. It is unclear whether these Latin formulas were used only in 15th-century humanistic manuscripts or whether they had been used in earlier manuscripts as well. I have not found a Latin equivalent of the Hebrew formula among the formulas and variants in Reynhout's book (above, n. 246). Indeed, in his Latin book on Hebrew incunabula, De-Rossi (J.B. De-Rossi, Annales hebraeo-typographici sec. XV, Parma 1795, pp. 12, 21) translated the formula printed at the end of Levi ben Gershon's commentary on Job, Avraham ben Ḥaim of Pesaro Press [Ferrara] 1476/7, as ad gloriam tuam, domine! (see a plate of the colophon page in A. Freimann (ed.), Thesaurus Typographiae Hebraicae saeculi XV, Berlin 1924–1931, A12) and at the end of the Tur Yore De'a, printed by the same printer in Ferrara, 1478/9 (should be: 1475/6. See the colophon plate in Freimann, ibid., A5,2). Peretz Tishby ('Defusei-'eres [incunabula] 'ivriyim', B, Kiryat Sefer, 60 [1987/8], pp. 898-899 [in Hebrew]) noticed that this formula appears also in Levi ben Gershon's commentary on the Pentateuch, Avraham Conat and A.J. Ha Ezraḥi Press [Mantua 1473/4-1475/6 or Ferrara 1476/7-1477/8] (see the plate of the colophon page in Freimann, ibid. A10, 2).

by Italian scribes only and its dissemination was greater than that of any other formula: indeed, it is found in about one eighth of all dated Italian manuscripts.[249]

Other formulas used in Italy are found in fewer manuscripts and, furthermore, they were not unique to Italian copyists.

ברוך נותן ליעף כח ולאין אונים עצמה ירבה (Isaiah 40:29, with the word ברוך added to the beginning of the verse) appears also as an acronym **בנל״ך ואע״י** and sometimes as a consecutive string **בנלכואע״י** – The full formula is well known and widespread and is manifest already in the earliest extant dated Italian codex,[250] and was used in other zones as well. The formula appears in about ten percent of all manuscripts (yet its use in Ashkenaz was relatively scarce). The distribution of the acronym form of the formula does not overlap exactly with that of the full formula. Its use in Ashkenaz was even more restricted, while Oriental copyists did not adopt it, and it became manifest only at a late period, nearly always in manuscripts copied by immigrants. Altogether, in its two forms, it is the most frequent scribal formula (Italy included), appearing in about a fifth of all dated manuscripts.[251]

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249 Quantitative data of this type are not based on the corpus of all dated units, but on that of colophoned units only. The occurrence of the formula in the Geniza fragment T-S A41.23 is exceptional – the fragment is a parchment outer bifolium from the final quire of Deuteronomy with the Masora. At its end (fol. 2r) the ending formulas were inscribed in the Masora script: חזק ; ברוך ה׳ לעולם אמן ואמן ; כבודך ה׳ הכותב וברוך הקורא (for the other formulas, see below). Although the dimensions of the bifolium are of a very ancient format, the script does not appear to be that early and, anyway, it is Oriental, which is rather puzzling. The damaged inscription (in a different hand!) <...זה הדפתר לל> is merely a note of ownership, not a colophon, as believed by Davies; see M.C. Davies, Taylor-Schechter Old Series and other Genizah Collection in Cambridge University Library (Hebrew Bible Manuscripts in the Cambridge Genizah Collection 1), Cambridge 1978, p. 210.

250 MS Vatican Vat. ebr. 31 was inscribed in 1072/3, apparently in Otranto (Codices hebraicis, Part II, Manuscrit 38). Zunz (Gesammelte Schriften, p. 78) already presented examples of this formula.

251 Berliner cites Avraham Ibn Ezra's commentary to Psalms 89:53 (ברוך ה׳ לעולם אמן ואמן, see below) in which the latter comments on this formula: <תהילים> וחכם גדול ספרדי אומר כי הסופר שכתב זה הספר תחלה כתב בסוף הספר ברוך השם שעזרנו לכתבו כולו כדרך הסופרים בדורינו לכתוב בעת האחרונה ברוך נותן ליעף כח (Berliner, 'Ein Gang', p. 93). Berliner was not aware that Ibn Ezra had already considered this matter in his commentary to Psalms 72:20 (כלו תפלות דוד בן ישי), but it appears that Ibn Ezra had commented also on the two preceding verses, which include ending formulas (ברוך ה׳ א׳ אלהי ישראל <...> וברוך שם), at the same time disclosing the Sefardic sage name (Yehuda HaLevi): ורי (כבודו לעולם> <...> אמן ואמן. יהודה הלוי אמר בשביל שהוא סוף ספר כתב כן הסופר הראשון כאשר נכתוב אנחנו ברוך נותן ליעף כח. This source was pointed out by B.M. Levine in his introduction to the edition of the epistle of Rabbi Sherira Gaon (Haifa, 1921, p. xx), where he comments on the prevalence of the formula in texts from the Geonic period onwards, including midrashim, yet he does not distinguish between formulas written by the authors and editors and formulas added by copyists and attributed as a matter of course to the former.

ברוך ה׳ לעולם אמן ואמן (Psalms 89:53)[252] and its later acronym בילא״ו – In its full form this is one of the earliest formulas, appearing in Oriental manuscripts already in the eleventh century.[253] Until the final quarter of the thirteenth century, the full formula was used only in the Orient, later spreading into other zones, but its use in Ashkenaz and in Byzantium was scarce. The acronym form, first found in a Sefardic manuscript from 1284, was manifest mostly in Spain, especially in the fifteenth century, and is absent from Ashkenazic manuscripts. Its scarce occurrences in the Orient (where the full form emerged) and in Italy are found in later manuscripts copied mainly by Sefardic immigrants.

Of the many other formulas, some of the more common ones are detailed below:

בר״ד מו״ך and later also in acronym form בריך רחמנא דסיען מריש ועד כען (in Aramaic) – The full formula appeared as early as the twelfth century in the Orient, and spread to some degree throughout all the book zones. In the fifteenth century, Sefardic and Byzantine copyists sometimes inscribed this ending formula in acronyms.

בד״ח לב״א and in full form בריך דיהב חילא לעבדיה בר אמתיה (in Aramaic)[254] – Less common than the previous one, occurring from the fourteenth century onward, seldom in the Orient and in Ashkenaz, and even less frequently in its full form.

חזק ונתחזק, הסופר לא יזק, לא היום ולא לעולם, עד שיעלה חמור בסולם, אשר יעקב אבינו חלם[255] and its variants – A singular and somewhat comic formula that was common in Ashkenaz, where it emerged. Frequently the scribe inserted his name in the rhymed formula instead of הסופר and thanks to this custom names of scribes who did not

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252 See above, n. 251.

253 See Codices hebraicis, Part II, mss. 19, 23, 28, 30, and others.

254 In a number of catalogues of small collections, the formula confused the compilers, who believed it to be the name of the scribe and recorded it as עבדיה בר אמתי.

255 Cf. Zunz, Zur Geschichte, p. 207; Zunz, Gesammelte Schriften, pp. 77-78; Berliner, 'Ein Gang', p. 94. Zunz already pointed out parallels (and perhaps sources) of this formula in medieval epigrams, and Berliner commented further on the matter. See also Steinschneider, Vorlesungen, pp. 48-49, and especially A. Altman, '"The Ladder of Ascension"', in Studies in Mysticism and Religion Presented to Gershom G. Scholem on his Seventieth Birthday, Jerusalem 1967, pp. 1–32. The aphorism that is most similar to the scribal formula is אם יעלה חמור בסולם תמצא דעת בכובסים, which appears in Pirqei Rabbenu haQadosh and in several variants of this source, such as Midrash Ma'ase Tora (תמצא חכמה בכסילים <...>). For a detailed survey of more sources, see my Hebrew version.

MS Paris Hébreu 35 <France?> 1283/4

inscribe a colophon became known to us. This ending formula was an expansion of the phrase חזק ונתחזק, often used in Ashkenazic and Sefardic manuscripts since the first decade of the thirteenth century. However, already in 1226/7, the formula in its extended form appeared in Germany, albeit without its humorous ending: חזק ונתחזק אהרן ב״ר חיים הכהן לא יזק, לא היום ולא לעולם, וברוב שלום ישולם.[256] The unexpected ending בסולם עד שיעלה חמור without the final rhymed verse **אשר יעקב אבינו חלם,** which was intended to reinforce the wish in a humorous manner, appears for the first time in a manuscript produced in Ashkenaz a few years later, in 1246.[257] The earliest instance in which this formula survived together with the added rhyming verse שיעקב אבינו חלם was an Ashkenazic manuscript dated 1283/4. From the beginning of the fourteenth century, this formula spread outside of France and Germany, especially in Spain and Provence. In its full form it was one of the most common ending formulas, especially widespread throughout the Ashkenazic zones and to a lesser degree in the Sefardic zones. Immigrant copyists – Ashkenazic and some Sefardic – who had imported it from their native lands, made use, albeit limited, of the formula in Italy.

Evidence that the copyists regarded the formula as jocular is evident from their practice of producing playful variants of the donkey. Already in 1286/7 an Ashkenazic copyist substituted a cow for the donkey. In another manuscript, copied in France a few years later (in 1290) the 'cow' version was presented with an added verse: שיעלה פרה <...>

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256 MS Oxford MS. Laud. Or. 271 (Neubauer Catalogue 1206). Ashkenazic copyists would create these final rhymed verses, as their talent allowed, e.g. חזק ונתחזק <...> לא יזק, ובתורה לבו יחזק, ועיניו יזהירו כמראה הבזק; Cf. Manuscrits médiévaux I, 4.

257 MS Moscow, RSL Guenzburg Collection 15, fol. 164v. The scribe skipped the blessing חזק ונתחזק before his name. Eventually another hand completed it below the colophon, adding אשר יעקב אבינו חלם <!>

בסולם ונראה לי שלא תעלה לעולם.[258] From this point onwards copyists placed an entire menagerie on the 'ladder' as substitutes for the original donkey – an elephant, camel, ox, mule, wild ass, and even edibles such as broiled venison, a macaroon, fish, and more.

Alexander Altmann hypothesised that the hidden source for the derisive remark about the donkey climbing the ladder was an anti-Muslim polemic, as it alludes to Mohammed's nocturnal voyage on Buraq (the celestial horse) from the mosque in Mecca to a more distant mosque. Later, this distant mosque was identified with the location of the Temple in Jerusalem, from which Mohammed ascended on the ladder to the seventh firmament in the presence of Allah.[259] However, the fact that the adaptation of the epigrammatic source into an ending formula, as well its broad dissemination, occurred in France and Germany, which were unacquainted with Islam, appear to indicate that the formula was devoid of polemic intent. The variations on the donkey clearly suggest that even if there were a slightly polemical note, the copyists had not been aware of it.

The following is a selection of additional formulas:

חזק הכותב ואמץ/ואמיץ הקורא – The first extant example of this formula is from the earliest complete codex which date is certain, inscribed in the Orient in 916;[260] thereafter it spread throughout all the book-zones, especially Italy and Byzantium.

ישמח הכותב ויגל הקורא and its variants – Although this formula was evidenced in an abbreviated form already in the tenth century in the Orient, it was especially common among Sefardic copyists in both the Sefardic book zone and in Italy.

תהלה לאל and its acronym **תל״ל**, as well as its expanded versions, especially **תהלה לאל עולם**, in acronym form **תל״ע** – These were widespread laudative formulas. The first extant examples are manifest in Italian manuscripts dating from the last quarter of the thirteenth century; from Italy they spread especially to Spain, where the formula תם ונשלם תהלה לאל עולם was a favourite, while a few examples survived from Ashkenaz as well. The acronym תל״ע was used only in Italy.

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258 See Manuscrits médiévaux I, 10.
259 See Altman (above, n. 255), pp. 1, 31-32.
260 See Codices hebraicis, part I, Manuscrit 3.

תושלב״ע or in its full form **תם ונשלם שבח לא בורא עולם** – Surprisingly, this well-known formula was found in a small number of manuscripts only.
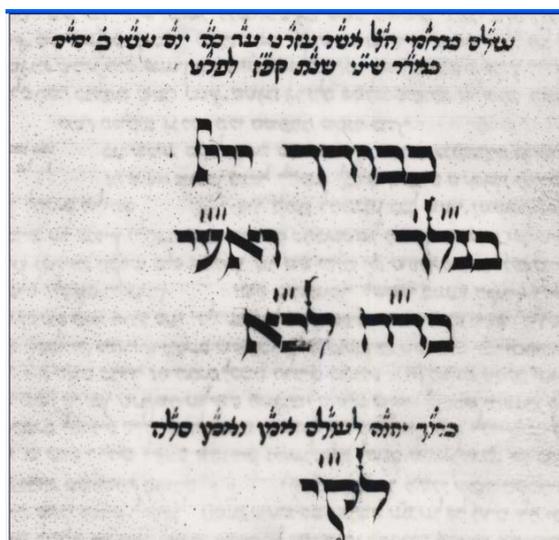
Five ending formulas at the end of a manuscript,
San Severino (Italy), 1427
MS Paris Hébreu 816, fol. 122v

Blessings upon the beginning of the copying

These scribal formulas are unrelated to the colophon but have a symmetrical affinity with the ending formulas. Just as scribes concluded their work with phrases of praise to God, self-encouragement, and well-wishing, they would inscribe opening formulas in the same spirit at the outset of their labour, as they began the copying. In the dated manuscript corpus, the number of manuscripts containing scribal opening formulas is smaller than those with ending formulas; for by its very nature, this corpus comprises of manuscripts which end with a colophon, while their opening folios have not always survived. This said, opening formulas are found in about one fifth of the dated manuscripts in all zones, from the beginning of the eleventh century and onwards, with a higher incidence in Italy.

עמ״י עש״ו (עזרי מעם יי עשה שמים וארץ [Psalms 121:2]) – The most common opening formula since the first extant manuscript which contained it was copied in eastern Turkey in 1203. It occurred in almost half of the manuscripts which contained such formulas, and in all zones, especially in Italy, though to a lesser degree in the Orient (but never in Yemen).

בשם י׳ בשם השם[261] / **בשם האל** [262] / (and in the Orient sometimes **בשמך רחמנא**) – Often abbreviated or with additions. It was the basic formula most frequently used in the Orient and to a lesser degree in Italy. A number of formulas derived from it. Some of the extended formulas were, in all likeliness, personally devised, while the rest became conventional forms.

בשם י׳ נעשה ונצליח and in acronym **בינ״ו** and **בהנו״א** (בשם השם נעשה ונצליח אמן) – This version appeared in the Orient already in the late-twelfth century and became widespread especially among Sefardic copyists (also in Italy) as soon as the acronym form was introduced; the acronym בהנו״א was used almost exclusively in Italy.

ב״ה – בסייעתא **בס״ד** – An acronym of **בשם השם**, but given the use of the acronym דשמייא 'with Heaven's help' – it should perhaps be also read as בעזרת השם, although this interpretation is unsupported by evidence. Both acronyms were used nearly exclusively by Sefardic copyists in all zones: they would inscribe them (especially the ב״ה formula) not only at the beginning of the copying, but also at the head of the manuscript's quires.

בטוב גדא אתחיל דא (with good fortune I start this) or **בטוב/בטב גדא** alone – A less common formula, more frequent in France (where it first emerged) and in the German lands. Ashkenazic copyists used it almost exclusively from the end of the thirteenth century and during the fourteenth century. Apart from Ashkenaz, it was used sparsely in both Spain and Byzantium but not in the Orient. In Italy it was mostly used by Ashkenazic immigrants and in a minority of cases by Sefardic ones.

איה״ן איה״ן or in the full form of the liturgical phrase **אנא י׳ הושיעה נא, אנא י׳ הצליחה** with some copyists omitting the fourth word and writing **איה״ן איה** נא – This formula was even less common and was used mainly in Italy.

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261 In the Middle Ages the tetragrammaton was represented by the letter yod (י׳) and not by the letter he (ה׳).

262 Sefer Ḥasidim, a source that is replete with information about book- and scribal craft in Germany, includes a section that mentions this formula and, typically, condemns the practice: חכם אחד ראה סופר שכתב בתחלת הספר ״בשם יי״ בגיליון <היינו בשוליים> למעלה. אמרו : למה עשית כן? אמר : על שם שסמוך אצל ״בשם יי״ ״זה הספר״. אמר לו החכם : כתיב ״לקרוא בשם י׳ זה הספר״, שצריך הסופר להתפלל להקב״ה שיצליחנו לכתוב ולסיים הספר, ולא לכתוב ״בשם השם״, דכתיב ״לא תוסיף עליו ולא תגרע ממנו (Sefer Ḥasidim, passage 703 = Sefer Ḥasidim, MS Parma, p. 136, and cf. ibid., passages 731, 1356, and in the Bologna edition, passage 888). The codex in question was presumably a Bible, for - as mentioned earlier - in Sefer Ḥasidim the term ספר unqualified refers to the Bible, and this would explain the prohibition of adding anything to it.

Apotropaic wishes at the bottom of the page

A common practice which seems to have developed only in Hebrew manuscripts was to inscribe in the bottom margins of some pages expressions of well-wishing - usually parts of biblical verses - in minute characters, sometimes in acronyms.[263] This widespread phenomenon can be observed, or at least its traces can be discerned even in codices which margins had been trimmed, in around eleven percent of all dated manuscripts, in all zones except for the Orient.[264] The element common to these formulas is that they all refer to the text of the final line of the page: when the text ended with damning or reproving words or with a verse concerning divine punishment and calamity, copyists would create a shield, as it were, against these by inscribing a supplication or a prayer, usually citing a biblical source which presented an antithesis to the calamitous phrase in the text. The custom is reminiscent of the practice found in biblical books that ended with dire expressions, namely recopying verses of consolation that appeared earlier in the text and affixing them to the final ending of the book.[265]

This common practice of protecting oneself against the catastrophic event mentioned in the text by inscribing a counter-text meant to offset it was not mentioned in nineteenth-century studies by Wissenschaft des Judentums scholars who were engaged in the unveiling and study of Hebrew manuscripts; yet it had already been referred to in *Sefer Ḥasidim*: כשהסופר בא לכתוב ובסוף הדף אירע לו שום תיבה של פורענות אל יכתוב בספר שום פסוק של נחמה שהרי הוא לבטלה.[266] The denouncement of this custom in *Sefer Ḥasidim* agrees with the prohibition and condemnation of other scribal customs which were discussed above, and their purpose was to diminish the scribe's persona and cut

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263 See M. Beit- Arié, 'Copyists' formulas at the bottom of the pages', Kirjat Sefer, 44 (1969), pp. 549-552 (in Hebrew), ibid., 45 (1970), p. 155; E.E. Urbach (a supplement to my article), ibid.

264 Apart from a few manuscripts inscribed there in the 16th century by exiles from Spain.

265 In the books of Isaiah, Minor Prophets, Lamentations, and Ecclesiastes. See Y. Berakhot, 5:1, 8d (L. Ginzberg, A Commentary of the Palestinian Talmud: a Study of the Development of the Halakah and Haggadah in Palestine and Babylonia, vol. 4, New York 1961, p. 59 [in Hebrew]; Pesiqta de-Rav Kahana, D. Mandelboim edition, New York 1962, p. 71 [in Hebrew]; Avraham Goldberg summarizes the issue in his review of the Mandelboim edition in Kirjat Sefer, 42 [1968], p. 71). Cf. the text of the *baraita* in B. Berakhot 31a: מצינו בנביאים הראשונים שסיימו דבריהם בדברי שבח ותנחומים (on the versions of the Tosefta, the Palestinian Talmud and more, see S. Lieberman, Tosefta ki-fshuta, a Comprehensive Commentary on the Tosefta, New York 1954/5, p. 47 [in Hebrew]). Cf. also M. Pesaḥim 10:4: מתחיל בגנות ומסיים בשבח.

266 Passage 705 = Sefer Ḥasidim, MS Parma, p. 136. The first, and seemingly only one to notice this practice was R.N.N. Rabbinowicz in his introduction to his Diqduqei Sofrim (Variae lectiones in Mischnam et in Talmud Babylonicum, vol. 11: Baba Batra, Munich 1868/9, p. 14); when describing MS Vatican Vat. ebr. 111, he notes: ובמקום שסיים הדף בדבר רע כתב למטה בגיליון מילות של ברכה. See E.E. Urbach's comment in his supplement to my article (above, n. 263).

short his intervention in the copied text. In fact this reaction accords with the ethical teachings of Ashkenazic piety, and proves, no doubt, that the scribal custom had already spread to Germany at that time. Indeed the earliest dated manuscripts containing prophylactic formulas are the earliest extant Ashkenazic ones, copied in the final quarter of the twelfth century.[267] Such formulas, meant to avert a calamity or inoculate against it, first appeared in Germany and France, in the margins of texts of all genres. In the thirteenth century, the custom spread to Spain and Italy. In Italy, the practice was even more widespread than in the zones of France and Germany, where it had most probably emerged: as against 15% of dated Ashkenazic manuscripts in which apotropaic wishes occur in the bottom margins (20% in the thirteenth century), 18% of Italian manuscripts (and in the fourteenth century 32%!) contain them. The practice was known but uncommon in Byzantium. It was employed in texts of all types, even in translated scientific treatises.

Here follow a few examples: MS London Ar. Or. 51, fol. 177v – one of the earliest dated Ashkenazic manuscripts, copied in 1188/9, apparently in France – ends with the words פנים הסתי<רתי> קצף בשצף (Isaiah 54:8), and at the bottom of the page the scribe inscribed in cursive script לק״יי (לישועתך קויתי יי) <Genesis 49:18>). Fol. 139v presents an even more conspicuous example which seems to be an exception, and possibly a unique occurrence. Here we encounter the reverse phenomenon: the adversity appears in the page's first word מקללני, and therefore the copyist countered it by inscribing מברכני in large square letters in the upper margins.

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267 The oldest dated Ashkenazic manuscript is where the custom made its earliest appearance; it is part of the Florence manuscript of the Talmud from 1177 (MS Firenze, Bib. Nazionale Magl. II-I-7, pp. 127-333), in which wish formulas can be seen at the bottom of two pages, although they had been somewhat trimmed, see Codices hebraicis, Part IV, Manuscrit 79. Other early codices in which evidence of this custom survived are Ashkenazic manuscripts from the last quarter of the 12th century – a grammatical manuscript copied in 1188/9, apparently in France (see Codices hebraicis, Part IV, Manuscrit 84) and a biblical manuscript from 1193 (ibid., ms. 91). Evidence for the prevalence of this custom already in mid-12th century is found in an unexpected source – a bilingual English manuscript, the Book of Psalms in Hebrew and in Latin, formerly kept at St. Augustine in Canterbury and rediscovered in the library of Leiden University (MS Leiden, University Or. 4725). There is no doubt that the Hebrew text was copied, somewhat artificially, by a Christian scribe, who nonetheless inscribed in the margin of one of the pages a shielding formula (just as he adopted other scribal practices of Hebrew scribes at the end of lines, e.g. the use of line fillers and anticipating the following word, which were unknown in Latin manuscripts). See Beit-Arié, Makings, p. 131, 135, n. 46 (and see ibid., Makings, n. 45, for examples of such wishes in other bilingual manuscripts produced in England, most likely in the 1230's); Beit-Arié, East and West, p. 110, n. 48 and the plate on p. 19, in which the wish formula בעזרי אלהים appears in a minute hand (slightly cut off at the base of the letters) at the bottom of fol. 43v, where the text ends with the words ודברי שנאה, from Psalms, 109:3.

As noted, most of the apotropaic wishes are comprised of biblical citations, sometimes only in acronym form. They make extensive use of prophylactic verses warding off death. The most common formula is the verse לא אמות כי אחיה ואספר מעשי יה (Psalms 118:17), appearing also in acronym. All the pages in which this verse is inscribed in the margins contain at the end of the text words deriving from the root מו״ת ('to die'), or semantically related words.[268] Another example of a formula of this type is ארך חיים <ושלום יוסיפו לך> שנות חיים וי״ל (based on Proverbs 3:2), mentioned above as one of the rare blessings for the living. Another is יחינו מיומים יקימנו ונחיה לפניו (based on Hosea 6:2)[269], as well as בלע המות לנצח (Isaiah 25:8), and other similar phrases.

In MS Oxford MS. Poc.108 (Ibn Ezra's commentary on the Pentateuch, Fano, 1431), fol. 26v ends with the lemma וינֻסו מלך סדם ועמרה ויפלו שמה (from the verse ויפלו שמה [Genesis 14:10]), and at the bottom of the page, under the catchword, the scribe added the verse יפול מצדך אלף ורבבה מימינך אלי״י <=אליך לא יגש> (Psalms 91:7).
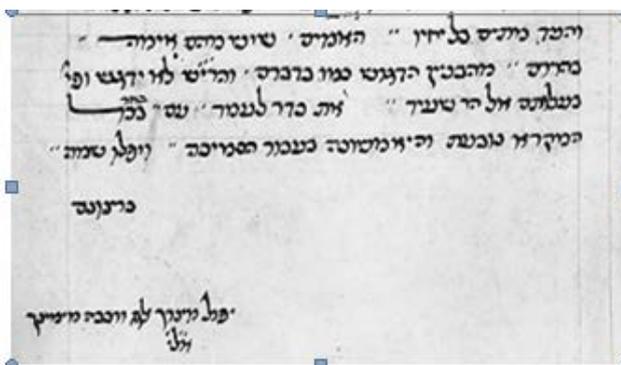
Other verses were selected to match against other tribulations. The verse רפאני ה׳ וארפא (Jeremiah 17:14) was inscribed at the bottom of a page where the word בחוליים occurred in the last line of the text, and again in a page ending with the word שיגפם.[270] The same scribe would often use various counter-blessings, such as והיה לראש ולא לזנב (based on Deut. 28: 13) at the bottom of a page containing the word בשפלות, and אם יתמהמה חכה לו כי בוא יבוא (Habbakuk 2:3) in the margins of a page containing the word הגלות.[271] Similar to this scribe's practice was that of another copyist in Italy who, in 1456, copied a maḥzor for the high holidays according to the Catalan rite. He too, and apparently the vocalizer as well, would often inscribe blessings (especially biblical verses) meant to neutralize the calamity, in this instance using only acronyms, e.g., in order to counter חלל ושביה (Deut. 32:42) he wrote שחעהאלי״י (i.e.

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268 For examples see my article 'Copyists' formulas at the bottom of the pages' (above, n. 263), p. 550 (in Hebrew).

269 This wish formula was inscribed in MS Oxford MS. Opp. Add. fol. 10, fol. 139r, although in the final line a statement refuting death appears – שלא ימות אביהם. In other words, regardless of its context the very occurrence of a word signifying calamity caused the copyist to erect a shield against it.

270 MS Oxford MS. Opp. 213, fols. 39v, 55v.

271 See in detail my above-cited article, 'Copyists' formulas at the bottom of the pages' (above, n. 263).

he **,אם ירדתי ממדרגות גבהים** (Jer. 10:25); to counter **על הגוים אשר לא ידעוך שפוך חמתך**, he wrote **י׳ זקף כפופים** (Ps. 146:8); to counter **ומכמרת יפרשו לו וחרמים**, **יז״כ** wrote **במ״א** (= most likely **ברוך מתיר אסורים**, Ps. 146:7).[272]

In a few manuscripts copyists inscribed blessing formulas or protective supplications that had no biblical source. For example, in the margins of a page ending with the words **בעירת אש השם בהם**, the copyist wrote **הצילינו מאשך הגדולה** (cf. Deut. 4:36). Another scribe who copied in 1538 on the island of Provato, near Turkey, inscribed the formula **רחמנא ליצלן**, whenever a page ended with menacing tribulations.[273]

Wishes accompanying dates in colophons

Some colophons contained wish formulas – either blessings or curses – that accompany the indication of the date. The custom was quite widespread in the Middle East, and in particular in Yemen, but rare in Spain, Italy, and Byzantium. In Ashkenaz it was not practiced at all.

סימן טוב לכל ישראל – The earliest formula in the Orient, appearing for the first time in 1002/3. Later it occured mainly as **סימן טוב**, with nothing added (in 1192 the full well-wishing formula was used in Byzantium as well).

תיהרס במהרה – A wish accompanying the mention of the year according to the Muslim calendar, which, as mentioned earlier, was named **קרן זעירה** (symbolizing Muslim rule). This formula occurs in twenty manuscripts in Judaeo-Arabic from the twelfth century and onwards (especially in Karaite manuscripts, some of which were copied by the same hand).

ישע יקרב ששון יערב / ישע יקרב – This abbreviated formula occurred for the first time in Aden in 1222 (where only the first word survived), yet it was more in use in its rhymed, expanded version (sometimes as an ending formula). It was first utilized in 1460/1 by the head of the scribes' family, Benaya ben Saʻadia, and after him by his descendants.[274] In Spain the date was accompanied by the brief wish formula **ישע יקרב** only in a few manuscripts inscribed in Toledo between 1222 and 1300. Similar formulas were encountered only rarely in the Orient. The same formula was found also in a manuscript copied in Lisbon in 1482.[275]

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272 See. ibid., p. 551.
273 See. ibid., p. 552.
274 MS London Or. 2370.
275 MS London Or. 2626-8 (Margoliouth Catalogue 62).

לכלות הפשע ולקרב הישע – A personal rhymed formula, which grew out of the formula יקרב ישע, and was appended to the date of eight out of ten colophons inscribed by the prolific scribe Sa'adia ben David the Yemenite, author of a commentary to Maimonides' *Mishne Tora,* who was active in Palestine and Syria in 1465-1485.[276]

לישועה קרובה – A wish similar to יקרב ישע, which was sometimes appended to the date in manuscripts produced in Yemen during the fourteenth and fifteenth centuries.

קץ וסוף לכל הצרות תחלה וראש לכל הבשורות – Appended to the date in a few Yemenite manuscripts produced in the fifteenth century.

לי"א – Acronym for the formula לברכה יהיה אמן, was used in Italy in the fifteenth century. In a few Italian colophons the formula appears in full.[277]

Blessing and curse formulas accompanying the indication of locality in colophons

יכוננה עליון (1035), **תיבנה במהרה** (988/9), **אלהים יכוננה עד עולם** (1035) are formulas appended to the indication of locality in a number of colophons inscribed in Jerusalem. In the Orient we find no other blessing formulas which relate to localities except those concerning Jerusalem.[278] However, in many Yemenite manuscripts from the fourteenth century and more so from the fifteenth century, it was customary to add blessing formulas which were limited in time, namely until the rebuilding of Jerusalem; or wishes of destruction alongside wishes for the reconstruction of Jerusalem. Here are a few examples:

תתבני עד דתתבני קרתא ירושלם / תשתכלל עד תתבני ירושלים[279]

במאתא חמדה תצדי וציון תחדי,[280] on the other hand. The contrasting form appeared for the first time in 1248:**וירושלים תשתכלל**[281]**במדינת אלטוילה תצדי** [282] . However, some twenty years later, a scribe who used the same formula in the same location toned it down and wrote:

תתקיים עד דתתבני ותשתכלל קרתא קדישתא דביתא ירושלם[283]

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276 See Manuscrits médiévaux, I, 100.

277 The formula appeared in full for the first time in a manuscript copied in Forcia in 1432 (vMS Moscow, RSL Guenzburg Collection 81).

278 Apart from the identical formula [[ותכ]]ונין[] תבנה appended to the name of the locality אתור (Egypt?) in MS Paris Hébreu 580, copied between 1217 and 1277 (the letter representing the decades according to the Era of Contracts was damaged).

279 Manuscrits médiévaux, I, 91 (and similarly דתשתכלל instead of דתתבני, e.g. ibid. I, 72)

280 ibid., I, 81.

281 See below, n. 284.

282 Manuscrits médiévaux, II, 32 (see the photograph of the colophon, ibid.)

283.1369 כ"י מוסקווה, אוסף גינצבורג 563, שנכתב ב׳אלטוילה׳ בשנת

In the latter half of the fifteenth century the formula spread in Yemen was:

וירושלם תתבני ותשתכלל[284]תחרוב ותצדי [285]

In the West, one blessing formula with variants was appended to indications of locality in a few manuscripts from Spain, Provence, and Portugal, dating from the fourteenth and fifteenth centuries: **יע"ע** [286] (יגן עליה), **יע"א** (יגן עליה אמן), and once in its full form **יגן השם בעדה**.[287]

ואני אלישע קרשקש <...> ראיתי כל המעשים שנעשו תחת השמש והנה הכל הבל ורעות רוח. ומכל העמל שעמלתי בזה העולם לא נשאר בידי כי אם זה החפץ

From the long colophon of the magnificent Bible that Elisha ben Avraham ben Benveniste, also known as Cresques, copied and decorated for himself over many years, completing it in 1382, no doubt in Mallorca. MS Sassoon 368 (microfilm in the Institute of Microfilmed Hebrew Manuscripts, National library of Israel 8894).

To this Bible Elisha appended a large collection of treatises, among others calendrical calculations and tables he computed as well as Masoretic lists and a dictionary.

The scribe-illuminator should be identified with the illustrious cartographer Cresques Avraham of Mallorca, who worked in the service of the kings of Aragon. See K. Kogman-Appel, ''Elisha ben Avraham, Known as Cresques": Scribe, Illuminator and Mapmaker in Fourteenth-Century Mallorca', *Ars Judaica*, 10 (2014), pp. 27-36; 'The Scholarly Interests of a scribe and Mapmaker in Fourteeth-Century Majorca: Elisha ben Abraham Bevenisti Cresques's Bookcase', in *The Late Medieval Hebrew Book in the Western Mediterranean: Hebrew Manuscripts and Incunabula*, ed. Javier del Barco, Leiden-Boston. 2015, pp. 148-181.

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284. היינו תישום ותחרב, על-פי תרגום יונתן לשירת חנה, שמ"א ב:ה, המכוון לרומי.

285 ראו, למשל, אוצר כתבי-יד עבריים, I 124.

286 MS Moscow, RSL Guenzburg Collection 27.

287 See e.g. Manuscrits médiévaux, I, 43.

Chapter 3: Writing Materials

The writing support, namely the material constituting the written surface of the manuscript, is no doubt the first and most basic component of the codex production and its visual appearance. At the time in which Hebrew codices were produced only two types of support were in use, as evidenced from extant manuscripts: parchment, made of domestic animals' skins (calves, goats, and sheep), and paper, for which the main raw material was linen rags and, at a later period in the Middle East, cotton as well; in other words, one writing support was obtained from animal sources while the other derived from vegetal sources in secondary use. In the early period of Greek and Latin codices in the Middle East, papyrus, made of reeds, was still in use as the main support for books in the scroll form, until parchment - which was better suited to the codex structure due to its flexibility and the fact that it lent itself to writing on both sides - gradually became the standard support.[1] After the era of the scroll-form Hebrew books found in the Judaean Desert, nearly all of which were inscribed on leather,[2] only a handful of papyrus fragments inscribed in Hebrew script have survived, most of them documentary texts from the Byzantine period. Almost none of these were fragments from books in the codex form.[3] Hence one should centre on the description and characterisation of two types of support: parchment, already prior to the Middle-Ages; and paper - the later type of support. The procedure of parchment production was imported from the Far East to the Near East and divulged not before the middle of the

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[1] There is no doubt that the transition from scroll to codex was related to a shift from the use of papyrus to parchment as a writing support; today, however, it is clear that the shift from scroll to codex was not dependent on the writing material. This has been demonstrated by Turner's study, *Early Codex*, pp. 35-42, 89-135. Turner conducted a comprehensive examination of the remains of early Greek, Latin, and Coptic codices, which implied that the codex form predated the shift to parchment and that during the first centuries of the codex, papyrus and parchment were used contemporaneously.

[2] Unlike the Judaean desert documents, inscribed on papyrus; see Tov, *Scribal Practices*, p. 31. Only a few papyri containing literary works were found, and Tov suggests that these may have been privately copied (cf. *ibid.,* p. 32)

[3] See above, chapter 1, section 1, subsection on 'The diffusion of the codex and its late adoption by the Jews'. A unique finding is a surviving damaged remnant of a Hebrew codex (from the Cairo Geniza) made of papyrus (MS Cambridge T–S 6H 9-21). The reconstruction of its fragments reveals that they comprise a multi- bifolium quire of at least 20 bifolia containing the liturgical poems of Yosef ben Nisan of Shave Qiryataim (See Sirat, *Papyrus*, pp. 67-80, and the identification of this text by Ezra Fleischer, *ibid.,* pp. 69-70).

eighth century.[4] Indeed, a type of support named נייר was mentioned already in the Mishna and in talmudic literature, but - as Rashi wisely explained - that term referred to papyrus.[5] Ancient world papyrus and medieval paper had in common their vegetal origin: papyrus was made from strips of reeds while paper was fabricated mainly from remains of cloth and recycled garments. Consequently, the term used for the old vegetal support came to indicate the new writing material, a process paralleled in European languages. It should be stressed that the use of skins – those of calves, sheep and goats - for the writing of scrolls was standard among Jews already at around the time of the Bible canonisation,[6] as demonstrated by the remainders of most of the Judaean Desert scrolls.[7] Their writing support was not parchment, which is a hide which both sides had been processed, but rather *gevil*, namely a hide processed for writing on one side only, as required by the scroll form.[8]

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[4] On the development of the research on writing supports, both parchment and paper, and on the evolution of its techniques, see the comprehensive compilation of Maniaci & Munafò (eds.), *Book Materials and Techniques.*

[5] סתם נייר של עשבים (Rashi on B. Gittin, 19b, and similarly in his commentary to B. Pesaḥim 42b and to B. Shabbat 78a, 79b). In Pesaḥim, *ibid.* Rashi adds: נייר עשוי מעשבים <...> <של סופרים> <היינו דבק> וקולן על ידי דבק שקורין גלו״יד (in French glud, see Catane, *Gloses*, no. 295, and many more). See M. Catane, 'Le monde du livre au temps de Rachi', in *Proceedings of the Seventh World Congress of Jewish Studies*, 7, Jerusalem, 1981, vol. 4: History of the Jews in Europe, pp. 9-15 (in Hebrew). Its seems that Isaiah di Trani of Italy (1180?-1250) was the first halakhic authority and commentator who identified the talmudic term with the medieval product manufactured by the Arabs before it came to be produced in Christian Europe. He disagreed with Rashi's interpretation and noted: ודאי שנייר הוא זה הבא מארץ ישמעאל, אבל אינו נעשה מעשבים כדפירש המורה, אלא מבלואי בגדים וחבלים עושין אותו, והוא חלק ונאה לכתיבה ואינו יכול להזדייף (*Sefer hamakhri'a*, ed. S.A. Wertheimer, Jerusalem 1998, p. 532; this source was brought to my attention by Simcha Emanuel). It is the first Jewish source that mentioned the production of Arabic paper and its raw materials. For similar identification and information by Menaḥem ben Shelomo Me'iri of Provence some fifty years later, see below, n. 66. See also the references in the research literature and other arguments in favour of identifying נייר in talmudic literature with papyrus, presented by S. Naeh in his article: 'Qaryana de-'igarta: he'arot la-diplomatiqa ha-talmudit' (above chapter 1, n. 30).

[6] See the discussion by Menaḥem Haran (M. Haran, 'Book-Scrolls in Israel in Pre-Exilic Times', *JJS*, 33 [1982], pp. 161–173), presenting evidence from the description of scrolls in the Bible and demonstrating that in those times scrolls were made of papyrus. In his opinion, the shift to wrffiting on hides occurred at the beginning of the Second Temple period. See idem, 'More Concerning Book-Scrolls in Israel in Pre-Exilic Times', *JJS*, 35 (1984), pp. 84–85, and idem, 'Book-Scrolls at the Beginning of the Second Temple Period: The Transition from Papyrus to Skins', *HUCA*, 54 (1983), pp. 111–122.

[7] The earliest Latin text written on parchment (MS London, Pap. 745) had been dated by palaeographers to the first century CE; see J. Vezin, 'La fabrication du manuscrit', in *Histoire de l'édition française*, ed. H.-J. Martin & R. Chartier, I: *Le livre conquérant – Du Moyen Âge au milieu du XVIIe siècle*, Paris 1983, p. 26.

[8] See below, section 1, 'Parchment'. For the halakhic requirements regarding the writing of Tora scrolls on *gevil*, see below in the text referenced by n. 26 and in the note. Early halakhic authorities cite Hai ben Sherira Gaon. E.g. *'Or Zarua'*, I, Hilkhot Tefillin, section 540: גויל קרוי אותו שמותקן כך בלי שום קילוף ואין בו תיקון קלף אלא מעופץ ומוקלף מעט כמו אבני גויל דפרשינן אבנים דלא משייפן <B. Bava Kama 4a>. For

As mentioned, the use of parchment or skin as writing support predated that of paper by centuries. The skill of paper production developed in China (initially it was probably not meant for writing), but as it spread within a few centuries in the Islamic territories, and much later in Christian Europe as well, paper replaced parchment as the principal writing material. In Hebrew book production (as in the non-Hebrew one) the transition from writing on expensive and durable parchment to of paper, a cheaper[9] and more fragile material, reduced the costs of book production, thus contributing to the widening scope of the distribution and use of books. This transition within the Islamic territories was much speedier than that which occurred in the Christian lands later, with the start of local paper production in those areas. In Hebrew bookcraft paper was quickly adopted, first in the lands of Islamic civilisation, especially in the Middle East, and then at a slower pace also in North Africa and Spain, thus becoming the standard writing support. This said, in the lands of Christian Europe (except for Byzantium) parchment was replaced by paper only in the late Middle Ages. In the Middle East, Arabic paper was used as the standard writing support for codices in the Hebrew script as early as the eleventh century, 1005 being the earliest year from which a Cairo Geniza fragment of a dated paper codex in Hebrew script survives.[10] In several articles and in a previous

the use of skin for most of the literary scrolls among the Judaean Desert documents, see Tov, *Scribal Practices*, p. 33-36. Tov names the writing support skin. Mordecai Glatzer ('Aleppo', pp. 185-191) compared the data on the material properties of the parchment in medieval manuscripts, as collected in the Hebrew Palaeography Project, with the external appearance of the writing support of the main Dead Sea scrolls and concluded that most were inscribed on *gevil*. The Temple Scroll was an exception, as it was inscribed on parchment.

[9] Not so during the first period of paper production, and certainly not in Europe – the price of paper in Bologna in 1280 was six times the price of parchment! See Briquet, *Filigranes*, vol. 2, p. 317. But Stevenson, an important researcher of Occidental paper watermarks and the editor of a new edition of Briquet's corpus, claimed that when paper first began to be produced in Italy its price was almost the same as that of parchment. And yet, paper continued to be expensive, and in the fifteenth century, before the invention of the print, the price of one or two paper quires was higher than a regular labourer's daily wages. See A. Stevenson, *The Problem of the Missale Speciale*, London 1967, p. 49. All researchers rely on Blum (author of books on the history of garments as well), who argued that paper became cheaper as its production accelerated, when fabric substituted wool as clothing material (especially for undergarments) in Europe, a fact that increased significantly the availability of the material of which paper was made (rags). See A. Blum, *Les origines du papier, de l'imprimerie et de la gravure*, Chartres 1932 (reprinted Paris 1935), pp. 34–35, 62–63. And cf. Briquet, *Opuscula*, pp.36-39.

[10] MS Cambridge T–S 8 Ca 1 (*Codices hebraicis*, Part I, Manuscrit 15). From about that time, a Karaite paper manuscript in Arabic script, inscribed in Ramle (Palestine) in 1004/5 and containing the Book of Ruth and Canticles in Arabic transliteration with a commentary by Yefet ben 'Eli, is extant (MS London Or. 2554 [Margoliouth Catalogue 302]); a damaged but nearly entire paper codex copied in Fusṭāṭ one year later (1006) has survived as MS St. Petersburg Евр.-Араб. I 4520 (*Codices hebraicis*, Part I, Manuscrit 16). The earliest dated Hebrew documents inscribed on paper predate the codices; to the best

version of this book was erroneously indicated that the earliest known dated Arabic manuscript was produced on Oriental paper in the year 233 according to the Muslim Era (848 CE).[11] Only twenty eight dated Oriental codices copied on parchment in Hebrew script have been documented, and they represent a mere 8% of the 353 dated Oriental manuscripts inscribed before 1500. These twenty eight manuscripts, many of them fragmentary, were all produced before 1327, most of them containing biblical texts (only two eleventh-century non-biblical dated Geniza fragments are known). One should note that many fragments and portions of undated biblical codices that were copied on parchment, most of them early, survived in the Geniza; they are now kept mainly in the Firkovitch collection in the National Library of Russia. A significant decline in the use of parchment is noticeable also among Arabic manuscripts copied in the Orient after the tenth century. This said, among all the extant dated Hebrew manuscripts from Yemen, 13% are inscribed on parchment. Of them, six are non-fragmentary (entire) manuscripts dating from the late-thirteenth century and up to the first third of the fourteenth century: one is a biblical codex while five deal with halakhic (legal) matters; out of these, four contain Maimonides' Code. The remaining eight extant parchment manuscripts are entirely biblical and their dates range from 1473 to 1490. Parchment continued to be used in Yemen even during the first decades of the sixteenth century.

The proportion of parchment manuscripts within the entire corpus of dated Hebrew manuscripts up to 1500 is 43%. In the Sefardic zone it reaches 36% (84% in the

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of my knowledge, these are three extant Geniza folios from the ledger of engagements and marriages of the Babylonian community in Damascus, dated 933: MS Cambridge T–S 16.181, T–S AS 146.66, T–S NS 320.108; and see M.A. Friedman, *Jewish Marriage in Palestine*, vol. 2, Tel-Aviv–New York 1981, nos. 53–55, pp. 396–439 (with references to earlier publications). The earliest Hebrew script found to date on paper – not of Arabic production but rather of a Chinese one – was, apparently, a letter in Judaeo-Persian discovered in Khotan (Chinese Turkistan). A microscopic examination of the paper determined it was produced between 751 and 796, although the text attests to an earlier date, circa 718. See D.S. Margoliouth in collaboration with M.A. Stein, W. Bacher, A.E. Cowley & J. Wiesner, 'An Early Judaeo-Persian Document from Khotan in the Stein Collection with Other Early Persia Documents', *Journal of the Royal Asiatic Society* (1903), pp.735–760. For a photograph of this document, see Birnbaum, Hebrew Scripts, no. 211.

[11] The manuscript, containing the work Saḥiḥ Muslim, is kept in the Regional Library of Alexandria. I came across it accidentally when visiting that library in 1979. Prof. Lutz Richter-Bernburg drew my attention that the date of its colophon that had been translated to me is totally wrong and is 978. For sources on Arabic paper manuscripts, apparently from 813 and onwards, see Zohar Amar, ('Paper Industry', p. 77, n. 77). On the earliest dated Armenian paper manuscript see A.S. Matevosian, 'Drevneiskaia armianskaia rukopis' na bumage', *Pamiatniki kul'tury. Novye otkrytiia. Pis'mennost'. Iskusstvo Arkheologiia*, Ezhegodnik 1976 (Moscow 1977), pp. 7–11 [according to *IPH Information*, 15 (1981), p. 104].

thirteenth century, 46% in the fourteenth century, 22% in the fifteenth century); in Ashkenaz – 82% (100% in the thirteenth century, 98% in the fourteenth century, 57% in the fifteenth century); in Italy 59% (98% in the thirteenth century, 82% in the fourteenth century, 51% in the fifteenth century); in Byzantium 14%; and, as already mentioned, in the Orient it amounts to 8% only while in Yemen it reaches 13%. The choice of the writing support – be it the expensive, elegant and long-lasting parchment or the cheaper and more fragile paper – mirrored the economic potential, financial constraints and social status of those who commissioned the copying or copied books for their own use, or of the society in which they dwelt. Yet, it was also dictated by the uses of the text: certain genres – Bibles, and prayer books, and to some extent halakhic corpora – were copied on the more durable and prestigious parchment even after the use of paper had spread, both because these manuscripts were intensively used and in view of their contents. The segmentation of the type of support according to destination shows no indication that commissioned manuscripts were inscribed on parchment in greater numbers than user-produced ones (in the group of user-produced manuscripts I included, in keeping with my approach, manuscripts which destination was not indicated in the colophon), yet most of the manuscripts produced on paper were user-produced. This said, such segmentation is worthless unless it relates to manuscripts produced in specific areas in specific periods. Surely, there is no point in applying it to Oriental manuscripts, due to the widespread adoption of Arabic paper in the Orient; nor should it be applied to Byzantine manuscripts since only a handful of dated parchment manuscripts have survived from this zone. In Ashkenaz, as previously mentioned, the use of paper was exceedingly rare before the fifteenth century, and similarly in Italy, where paper was hardly used until then. Accordingly, such segmentation can be indicative only for manuscripts produced in those zones during the fifteenth century. However, segmentation according to this criterion may be appropriately used in Spain from the fourteenth century on, given the early spread of the use of paper there. In fourteenth-century Spain the production rate of commissioned parchment manuscripts was similar to that of user-produced parchment manuscripts, while most of the paper manuscripts were user-produced. Throughout the fifteenth century one observes a slight increase in commissioned parchment manuscripts as against user-produced ones. During that same period, the number of commissioned paper manuscripts was higher than that of commissioned parchment manuscripts; however, about one half of all

Sefardic manuscripts dating from the fourteenth and fifteenth centuries were user-produced and inscribed on paper. In fifteenth-century Ashkenaz the number of user-produced parchment manuscripts and paper manuscripts was twice as high as that of commissioned parchment manuscripts and paper manuscripts. During the same period in Italy the number of commissioned parchment manuscripts was three times higher than that of commissioned paper manuscripts, and the number of user-produced paper manuscripts exceeded by some 35% that of user-produced parchment manuscripts.

The earliest extant Hebrew paper manuscripts produced outside the Middle East were from Spain: improved techniques for the manufacture of Oriental Arabic paper began in its Muslim part in mid-eleventh century or even before,[12] as plainly proven by two letters in Judaeo-Arabic dating from the middle of that century and discovered in the Cairo Geniza.[13] In one letter, Natan ben Naharay of Alexandria informs his cousin Naharay ben Nissim in Fusṭāṭ that he had failed to locate 'Andalusian' paper (i.e. from

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[12] This is the prevailing opinion, based on literary sources; see O. Valls i Subirà, *Paper and Watermarks in Catalonia*, ed. & transl. J.S.G. Simmons & B.J. van Ginneken-van de Kasteele (Monumenta Chartae Papyracae Historiam Illustrantia 12), vol. 1, Amsterdam 1970, p. 6. Later, this same historian of paper manufacture in Spain predated the beginnings of paper production to the middle of the tenth century, see idem, *The History of Paper in Spain*, transl. S. Nicholson, vol. 1, Madrid 1978, pp. 87 & 98. Cf. E. Lévi-Provençal, *Histoire de l'Espagne musulmane*, vol. 3, Paris 1950, pp. 33–34. On the other hand, the Dutch Orientalist van Koningsveld sought to disprove the early dating of paper production in Spain, arguing - based on primary sources - that it began only in mid-twelfth century, see P. Sj. van Koningsveld, *The Latin-Arabic Glossary of the Leiden University – A Contribution to the Study of Mozarabic Manuscripts and Literature*, Leiden 1976, pp. 23, 68 & note 80. Irigoin, an expert on Greek manuscripts and Oriental paper, followed Blum's lead and dated the beginnings of paper production in Spain to the early twelfth century; and Grohmann, a palaeographer and historian of Arabic manuscripts, following Karabacek, the historian of Arabic paper, cites the testimony of Al-Idrissi regarding the high quality of paper produced in Xátiva, see A. Grohmann, *Arabische Paläographie*, vol. 1, Vienna 1967, p. 101; Irigoin, 'Premiers manuscrits grecs', p. 200 [=*Griechische Kodikologie*, p. 139]; Karabacek, *Arabischer Papier*, p. 53 [p. 39 in the English translation]. See however, the summary and critical evaluation of these views in R.I. Burns, *Society and Documentation in Crusader Valencia* (Diplomatarium regni Valentiae 1), Princeton 1985, pp. 156–168. This said, the date of the earliest Arabic manuscript known to have been inscribed in Spain on paper (presumably not locally produced) is 970, see E. Lévi-Provençal, 'Un manuscrit de la Bibliothèque du Calife al-Hakam II', *Hespéris*, 18 (1934), pp. 198–200 (cited by von Koningsveld, *ibid.,* n. 75). Lévi-Provençal did not mention that the manuscript (kept today in a mosque in Fez) was indeed made of paper, but this is evident from the facsimile on the last page of his article (*ibid.*, p. 129).

[13] See M. Beit-Arié, 'The Contribution of the Fusṭāṭ Geniza to Hebrew Palaeography', *Pe'amim*, 41 (Autumn 1989), pp. 37-38 (in Hebrew). In a later letter written by the poet and philosopher Yehuda Ha-Levi in Christian Toledo in the final quarter of the eleventh century, he reported to his friend, the merchant Netan'el ben Ḥalfon, who resided in Cairo, about the delivery of a large amount of paper (500 sheets), presumably manufactured in Muslim Spain, see Goitein, *Mediterranean Society*, 5, pp. 457, 464, document no. 3 (also mentioned in O.R. Constable, *Trade and Traders in Muslim Spain: The Commercial Realignment of the Iberian Peninsula*, 900–1500, Cambridge 1996, p. 196).

Muslim Spain) as requested.[14] Additional evidence is contained in another letter in which Daniel ben 'Azaria Gaon, a merchant from Palestine during the years 1050-1060, ordered that certain responsa be copied for him in Fusṭāṭ on high quality paper, and he explains: not Egyptian, but Andalusian paper.[15] These letters attest to the fact that already in mid-eleventh century various types of paper were being imported from Muslim Spain to the Middle East. Anyway, the earliest extant dated Hebrew codex from Spain was a paper manuscript produced in Muslim Valencia in 1119, one hundred and twenty years before its *reconquista* by the Christians.[16] During the thirteenth century, only 16% of the extant manuscripts from the zones of Sefardic book culture – namely, the Iberian peninsula, North Africa and Provence – were produced on paper;[17] however, already in the fourteenth century the use of paper increased rapidly: in 41% of the manuscripts were produced in the first half of the century, then 68% in its second half. Yet only from the beginning of the fifteenth century did it become the standard writing support, with only one-fifth of Sefardic manuscripts being copied on parchment.

In the territories of Christian Europe – France, the German lands, and Italy, where the crystallisation of Hebrew bookcraft escaped the impact of Arabic civilisation – the use of paper in Hebrew book production did not spread as rapidly as it did in Latin manuscripts. In fact, paper would never substitute parchment as the standard writing support; at the very most it would match the extent to which parchment was used in the later medieval period. This in spite of the fact that in Italy the production of paper - eventually marketed to other countries in Western Europe - began already at the start of the thirteenth century. The earliest extant Hebrew paper manuscript from Italy was copied in 1276/7-1284,[18] while the earliest paper manuscript from Ashkenaz is dated

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[14] MS Jacques Mosseri Geniza Collection (now deposited at Cambridge University Library), IV.18, lines 15-18. See Goitein, *Mediterranean Society*, 1, 1967, pp. 81, 410. The letter has since been published by Gil, *In the Kingdom of Ishmael*, 3, no. 429, pp. 438-439 (in Hebrew), who dated it circa 1064. The passage translated by him into Hebrew reads: אבל ;עוד כתבת, אדוני, על קניית נייר מאלסְגֶלֶת או מישהו אחר לא מצאתי (נייר) ספרדי <במקור הערבי 'אנדלסי'> בעל איכות טובה <...> שאתה רוצה להעתקות (...?) ואולם נמצא שם (נייר) ספרדי פחות, ואצל אלסְגֶלֶת נייר שאמי רחב גדול, מחירו ה' דינרים הצרור ; אם הוא טוב בעיניך, אדוני, אקנה לך (*ibid.,* recto, lines 15-18).

[15] See Gil, *History of Palestine*, vol. 2, p. 688, no. 371, lines 3-5.

[16] MS St. Petersburg Евр.-Араб. I 2440 (*Codices hebraicis*, Part III, Manuscrit 57).

[17] This ratio of paper manuscripts and the figures quoted later in the passage include manuscripts produced with mixed quires, where the outer and central bifolia, or the outer bifolium only, were made of parchment while the remaining inner bifolia were made of paper (see below in section 3: Combination of paper and parchment). Presumably, parchment manuscripts would have lasted longer than paper ones and therefore it is possible that these figures represent not the real ratios but only a trend.

[18] MS St. Petersburg, Oriental Institute B 396.

1343/4.[19] At first, the use of paper was minimal in both zones, spreading only gradually. In fourteenth-century Italy only 18% of the dated manuscripts were copied on paper, but in the first half of the fifteenth century paper was used in one third of the production; yet only in the second half of that century did the number of paper manuscripts roughly match that of parchment manuscripts.[20] From France there is no extant dated paper manuscript from the time prior to the expulsion of the Jews at the end of the fourteenth century; in the German lands copyists began using the new writing support at an accelerated rate only in the fifteenth century. Like in Italy, the limited utilization of paper in Hebrew manuscripts in Germany was at odds with the rapid diffusion of paper in Latin manuscripts.[21] During the first half of the fifteenth century, one third of the dated Ashkenazic manuscripts were copied on paper, while in the second half of that century around half of them used paper. In Germany and Italy the Jews' adherence to producing books on the expensive type of support – namely, parchment - and their reluctance to adopt paper, which was bound to reduce the costs of production, may show a conservative approach in the realm of book production, as is also displayed in the ruling techniques used in Italy and the Ashkenazic zones; yet it may also reflect economic circumstances and the dictates of social status.

Hebrew Byzantine manuscripts are the only ones resembling the Oriental manuscripts in the rapid adoption of paper as the standard writing support. The earliest surviving Byzantine manuscript on (Oriental) paper was copied in גגרא, probably Gangra (Çankırı) in Turkey, being also the earliest extant Byzantine manuscript with an

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[19]A Kabbalistic manuscript (containing, among others, *Sefer ḥokhmat ha-nefesh*), documented by the Hebrew Palaeography Project (record A119), when it was owned by Rabbi Emmanuel Fisher of Jerusalem (in April 1990 it was offered on auction by Sotheby's Tel Aviv, and purchased by an Australian collector). The date is confirmed by the watermarks. Only two more dated Ashkenazic paper manuscripts have survived from the 14th century, both from its last decade.

[20] According to statistics displayed by Neddermeyer (*Von der Handschrift zum gedruckten Buch*, vol. 1, p. 259) regarding Latin (not necessarily dated) manuscripts from Italy: during the first half of the 14th century a quarter of the total number were paper manuscripts, and in the course of the second half of the century they numbered more than half; while during the first half of the 15th century – over 69% were paper manuscripts, and in the second half of that century they numbered over 71%.

[21] According to the data presented by Neddermayer (*ibid.*) regarding the Latin (not necessarily dated) manuscripts in the German lands: during the first half of the 14th century over 17% of them were paper manuscripts, and during the second half – over 76%! During the first half of the 15th century – over 89% were paper manuscripts, and so during the second half of the century. See also Ornato, *Apologia*, pp. 20-21. Neddermayer's data concerning the French manuscripts indicate that when it came to the use of paper the resemblance between Latin and Hebrew copyists in France was greater than that in Germany. During the first half of the 14th century, only 3% of French manuscripts were paper manuscripts while in the second half of the century they numbered more than 22%.

indication of locality.[22] In the fourteenth century a mere fifth of all Byzantine manuscripts were copied on parchment, and in the fifteenth century - one tenth only.

1. Parchment[23]

Parchment is the skin of sheep, goats, or calves, both sides of which had been processed to serve as a writing surface suitable for hand manufactured books in the codex form. Initially, the term קלף (*qelaf*) [24] was used in talmudic literature to describe hides that

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[22] MS St. Petersburg Евр. II C 161. The same copyist copied another manuscript there on the following year (MS St. Petersburg Евр. II A 132/2).

[23] In French 'parchemin', in German 'Pergament', in Italian 'pergamena', in Latin 'pergamena', 'membrana', in Arabic رقّ, in halakhic sources in Judaeo-Arabic and in book-lists from the Geniza רק (see Allony, *Jewish Library*, according to the index). For two basic works on the technology of parchment production see R. Reed, *Ancient Skins, Parchments and Leathers*, London–New York 1972; idem, *The Nature and Making of Parchment*, London 1975; and see the collection *Pergament – Geschichte, Struktur, Restaurierung, Herstellung*, ed. P. Rück (Historische Hilfswissenschaften 2), Sigmaringen 1991 (and ibid., pp. 35-43, M. Haran, 'Technological Heritage in the Preparation of Skins for Biblical Texts in Medieval Oriental Jewry'). For a detailed survey on the nature types of skins and parchments used by Jews (based on halakhic sources that deal solely with Tora scrolls), with a wealth of comparative material, see M. Haran, 'Bible Scrolls in Eastern and Western Jewish Communities from Qumran to the High Middle Ages', *HUCA*, 56 (1985), pp. 21–62. For a literature survey on technologies of parchment production from antiquity until the Middle Ages, see C. Chahine, 'De la peau au parchemin: Évolution d'un support de l'écriture', *Quinio*, 3 (2001), pp. 17–50. A detailed survey of the literature on the history of the research on parchment in Latin palaeography: P. Rück, 'Le parchemin entre les laboratoires et la recherche historique: La constitution d'un nouvel object archéologique', *Bolletino dell'Istituto Centrale per la Patologia del Libro*, 42 (1988), pp. 81–95. For a comprehensive study presenting a meticulous examination of the various characteristics of parchment in Italy's cultural zones in the 11th century and the relation of those characteristics to one another, e.g.: parchment size, degree to which holes are present, uneven margins, ratios of folio height and width, source of skin, see F. Bianchi et al., 'La structure matérielle du codex dans les principales aires culturelles de l'Italie du XIe Siècle', in Maniaci & Munafò (eds.), *Book Materials and Techniques*, vol. 2, pp. 363-452.

[24] According to most of the known vocalization and pronunciation traditions – Palestinian-Italian, French, Sefardic, and Yemenite – the word should be vocalized as קֶלֶף (=*qelef*). This is the vocalization found in the Kaufmann manuscript of the Mishna (M. Shabbat 8: 3). Ḥanoch Yalon vocalized the word as קְלַף in his vocalised edition of the Mishna-(Jerusalem-Tel-Aviv 1952-1959); in his book *Mavo' le-niqqud ha-Mishna* (Jerusalem 1964, p. 213) (in Hebrew) he notes that the Yemenite reading is קֶלֶף (cf. Y. Shivti'el, 'Massorot ha-Teymanim be-diqduq leshon ḥakhamim II, *Quntresim le-'Inyanei ha-Lashon ha-'Ivrit*, 2 [1936-1938], p. 63 [=*Qovets ma'amarim bi-leshon HaZaL* <1>, ed. M. Bar-Asher, Jerusalem, 1972, p. 217] [in Hebrew]). The same can be deduced from the rhyme in the responsum of Rabbi Ya'aqov ben Me'ir Tam to Rabbi Ephraim ben Yitshaq: ואם תשלח קלף אשיב תשובות אלף (*qelef* rhyming with *elef*) (*Sefer ha-yashar*, ed. E.Z. Margaliot and S. Rosenthal, Berlin 1898, section 57, p. 130 [in Hebrew]; also cited by A.M. Habermann in connection to the scarcity of books in the Middle Ages in his book *Toledot ha-sefer ha-'ivri* [Jerusalem, 1945, p. 10 (in Hebrew)], where he notes [p. 104] the implications for the pronunciation of the word קלף); this is the same vocalization given by Eliyahu (Baḥur) Levita in his dictionary *Sefer ha-Tishbi* (Isny, 1541), [=*The book Tishbi: Facsimile of the First Edition, Isny, 1541*, ed. M. Krupp, Jerusalem 2001], under the entry קלף: ומזה נקרא העור שכותבין עליו קֶלֶף לפי שנקלף ממנו השער. In his article 'al massoret leshon ḥakhamim ba-shira ha-'ivrit bi-yemei habeinayim' (*Leshonenu*, 37 [1973], p. 143 [in Hebrew]), Y. Tobi refers to a similar vocalization in *Taḥkemoni* by Elḥarizi according to Y. Toporovsky's edition (Tel-Aviv 1952). Following Toby's article, S. Abramson notes in *Leshonenu* (ibid., p. 237) that Ben-Yehuda

had been split and processed for the writing on one side of the ritual *tefillin* (prayer phylacteries worn on the arm and forehead), but some of the Rishonim (the early medieval halakhic authorities) used this term to denote a hide which had been processed on both its sides for the purpose of writing a codex. Hides of which only one side was processed for writing, suited for the scroll form and intended for the writing of a Tora scroll, would be called גויל in talmudic literature (*gevil*);[25] yet in the Middle Ages some halakhic scholars would use קלף (*qelaf*) to denote parchment meant for this use. The talmudic terms for the various types of skins intended for the ritual writing of the Tora Scroll, *tefillin*, and *mezuza*, as well as their modes of production, were indicated by Maimonides in his Code *Mishne Tora*, *Sefer Ahava, Hilkhot Tefillin, Mezuza and Sefer Torah*, 1:6-9:

> There are three kinds of leather: *gevil*, *qelaf*, and *dukhsustus*. How are they prepared? The hide of a domesticated or wild animal is taken, and after the hair is removed, it is salted, worked with flour and then with gallnut or other substances which strengthen the leather and cause it to contract. At this stage it is called *gevil*. If after the hair was removed, the hide was split through its thickness into two, as the leatherworkers know how to do, so that it became two pieces of leather - one thin, on the hair side, and a thicker one on the flesh side, and if these were worked first with salt, then with flour and then with gallnut or other similar substances, then the hair side is *dukhsustus* and the flesh side is called *qelaf*. 8. It is a law transmitted by Moses from Sinai that a Torah scroll be written on *gevil*, on the hair side; that tefillin be inscribed on *qelaf* on the flesh side; and that the mezuzah be inscribed on
>
> *dukhsustus*, on the hair side. Anything inscribed on *qelaf* on the hair side, or on *gevil* or *dukhsustus* on the flesh side, is unfit.
>
> Even though this is the law from Sinai, a Torah scroll written on *qelaf* is fit. *Gevil* was specified only to exclude *dukhsustus*, for a Torah scroll written on it is unfit. So also, if one has written a mezuzah on *qelaf* or on *gevil*, it is fit;

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dictionary (p. 5569, col. 2) cites a rhyming salutation from Buksdorf's collection of epistles: שלומים אלף על מעט הקלף לשר האלף, noting that this salutation appears in the responsa at the end of *Sefer Be'er-Sheva'* by Issachar Eylenburg, section 71.

[25] On the thickness of *qelaf* versus that of *gevil* in the Dead Sea Scrolls, see Glatzer, 'Aleppo', pp. 186-188.

dukhsustus was only specified as being preferred (*The Code of Maimonides, Book Two: The Book of Love*, tr. M. Kellner, New Haven-London 2004).[26]

It is noteworthy that during the long period in which parchment was being produced in the zones of codex culture around the Mediterranean its basic production technique did not change: skins were immersed for a long while, in the West - in lime solution, and in the Orient - at least according to Jewish practice - in a saline solution, as evidenced by the ancient talmudic and halakhic literature and according to chemical tests performed on the Judaean Desert scrolls. Subsequently the hair would be removed and the hides stretched and dried on frames, where their fibres would be fixated, their sides scraped or rubbed, smoothed, and glossed by an assortment of finishing techniques that ensured that both sides of the parchment were suitable for writing with calamus and ink and for decorating with colours, silver and gold.[27]

Processing a skin for liturgical *Sefer Tora* in a workshop in Kiryat Moshe, Jerusalem, 1992

Literary halakhic sources and a number of chemical analyses attest to differences according to regions and to periods of time in the materials used for the processing and the polishing of the writing support

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[26] On the precise wording of Maimonides' text, which was corrupted and altered in printed versions, and on the two interpretative traditions regarding the splitting of the hide, see M. Glatzer, 'The Book of Books: From Scroll to Codex and into Print', in *Jerusalem Crown, the Bible of the Hebrew University of Jerusalem: Companion Volume*, ed. M. Glatzer, Jerusalem 2002, pp. 42-45, 57-59 (in Hebrew).

[27] Even in recent generations the basic process of producing *gevil* for writing Tora scrolls has not changed. According to the description by Amram Qoraḥ, the last rabbi of Yemenite Jews and a ritual scribe, the final processing of the hides for preparing *gevil* for a Tora scroll or *qelaf* for *tefillin* was executed by the scribes themselves (A. Qorah, *Se'arat Teiman*, Jerusalem 1954, p. 99 [in Hebrew]):

אם הסופר רוצה לכתוב ס״ת על הגויל, הולך אל הבורסקי, בורר עורות כבשים מעובדים כחפצו, והעבדן מוכרן לו גולמים בלי קיצוע, ולא תיקון. הסופר מביאן לביתו, מרככן בזילוף מים, ושוטחן וממתחן ומחליק פנים שלצד הבשר ע״יי כלי הנקרא מבשרה, ואחר כך חותך היתרונות והקרנות שבקצוות, עד שיהיה העור יריעה מרובעת, ואז צובע היריעה בצבע הרד <תבלין שהובא מהודו, צבעו צהוב כהה, מעין כתום> הדומה לעין הכרכום, ורושם בשני קצות היריעה נקבים בכלי הנקרא סרגל כמנין השטין הנהוגים, ומשרטט אחר שמשפשף פני היריעה שבצד שֶׁער באבן חלקה יפה, בכדי שתהיה ראויה ונוח<ה> לכתיבה, ומחלק הדפים ומתחיל במלאכתו. רוב הסופרים אומנים לעבד קלפים, והסופר עושה כל המלאכות שנזכרו במעשה הגויל, ומחליק פני העור שלצד בשר שיעור שראוי לכתב עליו, ומשאירו לבן ואינו צובעו בשום צבע. הדוכסוסטוס אין נמצא בתימן, כי אין אומנים היודעים לחלוק את העור לשנים, והדיו אינם יודעים לעשותו כי אם במי עפצא וקנקנתום

In 1970 Asher יאקאב, who owned a workshop for the processing of hides, mainly for Tora scrolls, in Qiryat Moshe (Jerusalem), described the process to me in as follows: (1) immersion in water up to 10 days; (2) immersion in slaked lime (calcium hydroxide) up to three weeks; (3) easy removal of the hair; (4) repeated stretching of the hides in frames; (5) scraping with a knife several times (for the writing of Tora scrolls, *tefillin*, and *mezuza* only the flesh side is thoroughly scraped). The hides remain stretched in the frames until they are dry. The entire process lasts around two months. See photo above.

used for scrolls, particularly in what concerns the use of tannin in the Orient. Indeed, these differences affected the utilization of parchment, produced there according to Arabic practice (رَقّ), for writing Tora scrolls since parchment thus produced was meant to be used on both sides while the halakhic requirement was that Tora scrolls be written on *gevil*.[28] Differences in production techniques and the materials used can be brought to light only through chemical, microscopic and to some extent physical analyses. Obviously, these can be carried out only to a limited extent and, moreover, even if non-invasive techniques were used extensively and regional chemical characteristics were found, this would still not furnish a convenient codicological tool to be applied comprehensively to all parchment manuscripts. This said, the visual appearance and characteristics, especially of the hair side, would normally vary from zone to zone, sometimes even from period to period, and therefore they can serve as codicological criteria for identifying the provenance of an undated manuscript (in Ashkenazic manuscripts they can moreover serve as indicators for the dating as well). In light of this, the typology of parchment types used in Hebrew dated manuscripts is not based on the methods of dressing the hides but rather on the appearance of the parchment sides, particularly the hair side, the variations of which were certainly due to the differences in the process of parchment production. In hair sides that had not been scraped the patterns of remaining hair follicles would sometimes indicate which animal skins were processed. The hides of sheep, goats or calves display typical patterns which

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[28] See Haran's articles (n. 23, above). In connection with sources for Rav Hai Gaon's responsum regarding the types of skin processing (in which the רק is mentioned) cited in his article in *Tarbiz* (p. 369, n. 45), one should add the editing of Ts. Gruner, 'Teshuvot le-rav Hai Gaon be-'inyan tefilin' in *Michtam le-David: Rabbi David Ochs Memorial Volume (1905-1975)*, ed. Y. Gilat and E. Stern, Ramat-Gan 1977, pp. 172-181 (in Hebrew), and see ibid., (p. 174) on Maimonides' responsum to the pupils of R. Ephraim (*Responsa quae exstant ab ipso arabice scripta ex schedis cairensibus et libris tam manu scriptis quam impressis R. Moses b. Maimon*, ed. J. Blau, vol. 1, Jerusalem 1957, section 139, p. 268), which preceded the composing of *Mishne Tora* (Maimonides' Code), and in which Rabbi Hai's words are cited. See also the following in Maimonides' response: וספרו (לנו) על ארצות המערב ואלרו"ם שכל ספריהם שהרי אינו ספר תורה אלא כחומש <...> ר"ק (J. Blau edition, vol. 2, Jerusalem 1961, section 162, pp. 310-311). It seems that the many halakhic sources (see also I.M. Ta-Shma, *Ritual, Custom and Reality in Franco-Germany*, 1000-1350 , Jerusalem 1996, pp. 289-302 [in Hebrew]) do not contribute to our knowledge of the processing of parchment for books, for they pertain to the preparation of *gevil* for the writing of Tora scrolls based on the talmudic guidelines. According to a few sources, the practice of processing skins with gallnuts according to the talmudic prescription (mentioned by Maimonides in his above-quoted summary) had not been customaty anywhere but in Babylonia. See L. Ginzberg, *Ginzei Schechter*, New York 1938-1939 (Texts and Studies of the Jewish Theological Seminary of America 8), pp. 527-535 (in Hebrew).

show the distribution or clumping together of hair residues, as shown in the enlarged photos below.[29]
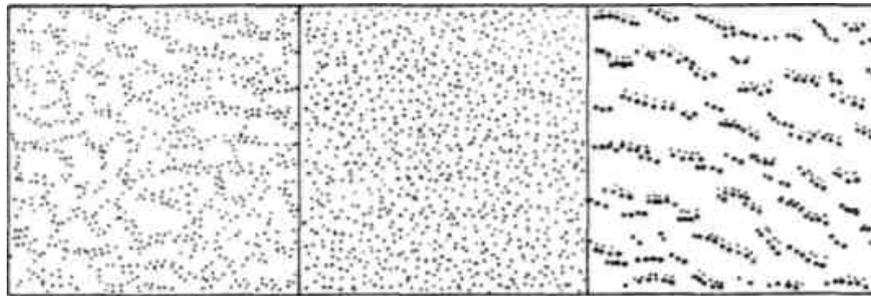
schapeleer   kalfsleer   geiteleer

MS Paris, Hébreu 1221, fol.138r
<Italy>, 1284

Overall, one can observe in the parchment of both Oriental and Ashkenazic manuscripts distinctive visual characteristics which impart the evolvement of the production process as well as the chronological and regional distribution of these manuscripts. Similarly, the parchment used for ...utch terms for binding: W.K. Gnirrep, J.P. ...ie voor de beschrijving van de constructies ... (from left to right sheepskin, calf's skin, goatskin). The hyperlink is accessible via the website of the Dutch Royal Library in The Hague: http://www.kb.nl/cons/kneep/kneep_en_binding_digitaal_20080410.pdf. Examination by electronic microscope may allow more precise identification of the animals from which the skins derived. On the scientific methods for identifying animal skins that were used for parchment, along with tables and a bibliography, see: F. Juchauld, Ph. Bonnenberger & A. Komenda, 'Identification de l'espèce animale des cuirs de reliure et des parchemins', in Zerdoun Bat-Yehouda & Bourlet (eds.), *Matériaux du livre*, pp. 13-28. In recent times preliminary tests done on European medieval parchment have shown traces of nucleic acid (DNA) that can be isolated and analyzed. Genetic analysis of parchment may be able to identify not only the type of animal from which the skin had been taken, but also the biological affinities of various parchments, i.e. of bifolia produced from the same hide; subsequent to the accumulation of a large number of data, a DNA test would allow us to identify the geographical provenance of the herd from which the skins were taken: see T. Stinson, 'Counting Sheep: Potential Applications of DNA Analysis to the Study of Medieval Parchment Production', in *Kodikologie und Paläographie im Digitalen Zeitalter / Codicology and Palaeography in the Digital Age*, vol. 2, ed. F. Fischer, Ch. Fritz & G. Volger, Norderstedt 2010, pp. 191–207.

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Italian manuscripts and for early Ashkenazic ones displays marked visual characteristics, whereas Sefardic parchment is a class apart: it is undoubtedly different from other parchments, yet its characteristics are less defined. It is unclear whether our proposed typology, based on the visual appearance of parchment sides in Hebrew manuscripts, would befit non-Hebrew manuscripts as well in the geo-cultural zones of Hebrew book production. It stands to reason that so it should be, assuming that Jews had been using the locally available parchment and not parchment of their own making. I myself am not aware of clear evidence that Jews were engaged in the production of parchment for making codices, either for their own use or on a large scale, although there are documentary testimonies from Spain and Italy that Jews had, in fact, been trading in hides and parchment (and paper as well).[30] However, this would be hard to

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[30] Latin documents attest that Jews in Frankfurt am Main were required to supply quotas of parchment to the imperial chancellery in the 14th and 15th centuries. See W. Wattenbach, *Das Schriftwesen im Mittelalter*[3], Leipzig 1896, p. 131. Wattenbach concluded that the Jews produced the parchment and hypothesized that this may have been the case in other cities, but such a conclusion is unattested. Regarding the question whether Jews in Germany had been producing parchment, the evidence of *Sefer Ḥasidim* should again be cited (regarding the rejection of the influence of a zodiac sign on a person's nature), which attests to the fact that the production of parchment was an unfamiliar occupation among Jews in Germany ca. 1200: איך נעשה זה שלעולם לא יוולד יהודי במזל שיעשה אמנות של גוים כגון עבדנים <מעבדי עורות> ובנאים וחייטים במדינות שאינם עושים מלאכה ואינם רגילים לעשות שום מלאכה (according to the facsimile edition of MS Parma, passage 989, p. 180). Nonetheless, it appears that Jews did independently produce *gevilim* for Tora scrolls, and parchment for *tefillin*, because of the halakhic requirements, as Maimonides summarized in his Code: גויל של ספר תורה וקלף של תפילין <...> צריך לעבד אותן לשמן ואם עבדן שלא לשמן פסולין לפיכך אם עבדן הכותי פסולין ואע״פ שאמרנו לכותי לעבד עור זה לשם הספר (Sefer Ahava, Hilkhot Tefillin, Mezuza, ve-Sefer Tora 1:11, according to MS Oxford MS. Hunt. 80, proofed against Maimonides' own manuscript and authorized by his own signature, fol. 120r). A direct evidence regarding the manufacture of *gevil* by Rabbi Ya'aqov Ben Meir (Rabbenu Tam), for the writing of a scroll of Esther in his own hand appears in a responsum signed with his name and quoted in *Sefer RABIH* at the beginning of Tractate Megilla עיבוד המגילה, בדידי הוה עובדא שהיתה לי מגילה כתובה בכתב ידי ולא היו הקלפים מעובדין לשמן, וקניתי עורות ונתתים בסיד והוצאתים מן הסיד, וכשנתנו למים על ידי אחד מנערי ונמרטו על ידי הנערים ובכל המעשים סייעתי, וכתבתי אחרת ועדין שתיהם בידי (Eli'ezer ben Yo'el HaLevi, *Sefer RABIH hu Avi ha'ezri*, ed. D. Dablitzky, Bnei Brak 2005, passage 548, p. 163; I am grateful to Simcha Emanuel who drew my attention to this source). If Jews did produce *gevilim* for Tora scrolls, they may have also produced parchment for writing codices. However, I found no mention of the production of parchment for books in either the halakhic or responsa literature. Sarit Shalev-Eyni recently drew my attention to a document dated 1331 from the city council of Esslingen (in Germany) in which the council replied to a query by the city council of Reutlingen concerning the guilds in Esslingen. They stated in reply that tanners as well as parchmenters had a guild of their own and that they selected one of the tanners as *Maister* (Head of the Guild); if a Jew wished to join them he would have to buy his membership in the guild and at the same time maintain the practices of his religion - namely, refrain from attending Christian ceremonies (Andreas Lenhertz and Ya'aqov Guggenheim assisted me in translating the German text). Assuming that this document was not an isolated testimony to the fact that Jews practiced the profession of tanners, at least in Germany, this would explain the discrepancy in the timing of the earliest attested appearance of parchment with equalised sides in Latin manuscripts as against its appearance in Hebrew manuscripts in Germany.

determine given the scant comprehensive research on the visual aspects of parchment sides in Latin manuscripts (apart from the examination of a few hundred dated Latin manuscripts produced in France and in the German lands and their environs which we carried out recently for comparative purposes - see below in the appendix: Comparison of the parchments of Ashkenazic and Latin manuscripts produced in the same areas), and the lack of such research in Greek and Arabic manuscripts. In fact, the impression arising from the random examination of parchment used in Arabic manuscripts from the Middle East is that it looks identical to the parchment used in Oriental Hebrew manuscripts. Indeed, this corresponds to the testimonies of the halakhic sources mentioned above.

Italian parchment

The parchment employed by Jewish scribes in Italy since the production of the earliest extant dated Hebrew manuscripts in 1072/1073[31] and until the fifteenth century retained the natural differentiation between hair and flesh sides. The dissimilarities of the sides are pronounced and easily discerned: hair sides are coarse and scraped, with remaining hair roots and follicles, while flesh sides are smoother and visibly lighter than hair sides. The quire bifolia are arranged by matching the parchment sides – each opening shows hair side facing hair side and, alternately, flesh sides facing flesh sides (see below, chapter 4: Quiring), and the contrast between the alternating openings is quite marked. Only high-quality fifteenth-century manuscripts, more particularly illuminated and decorated ones, were copied on the finest and thinnest parchment, of very light hue (known from Italian humanistic codices), in which hair roots were invisible. This said, the sides of this very refined parchment are still visibly distinct.

Ashkenazic parchment

The parchment employed in the German lands and to a certain extent - especially from the last third of the thirteenth century and on - also in France, does not resemble the parchment used in other geo-cultural zones. It reflects a shift in the process of production and, most likely, also in the aesthetic concept of book design. Until this shift, parchment used by Jewish scribes in all areas of Hebrew book production was processed in a way that made it possible to distinguish between its sides, either easily -

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[31] *Codices hebraicis*, Part II, Manuscrit 38; Part III, mss. 43, 48, Part IV, Manuscrit 71. These are the earliest extant codices from the European continent.

like in Italy, or with difficulty – as it was in the Orient. The sides would preserve their natural differences to a greater or lesser measure, and the quire openings would be arranged with matching sides facing each other. Indeed, some bifolia in the few extant dated Ashkenazic codices from the last quarter of the twelfth century[32] bear an aspect similar to that of Italian parchment, with stark dissimilarity between the sides; this appearance is all the more displayed in all the bifolia of the undated early Ashkenazic codices, some of which were copied prior to the extant dated manuscripts.[33] However, by the end of the twelfth century, at the latest, the first signs of a shift in the processing of parchment became manifest in Germany, northern France and England, as suggested by the visual appearance of the parchment of Hebrew manuscripts. Many of the codices produced there show that dissimilarities between the sides were being reduced, aiming at the equalization of the visual aspect of hair and flesh sides; eventually, in the last decades of the thirteenth century, parchment sides in Germany had been – with hardly any exception – equalised to the degree of being practically indistinguishable. Since the great majority of the extant Ashkenazic manuscripts originated from Germany – due, among others, to the fourteenth-century expulsions of the Jews from France - it so happened that most of them were inscribed on parchment which sides appear identical. Consequently, this has become the typical distinguishing mark of Ashkenazic manuscripts.

Already in the earliest Ashkenazic manuscript, dated 1177, one observes that some bifolia are of parchment which hair sides were scraped so as to leave no trace of follicles, while flesh sides were scraped as well.[34] This said, in a manuscript dated 1189[35] - in which hardly any roots remained on the hair sides – one can distinguish easily between the sides of some bifolia, while in other bifolia the sides are fully equalised. In a manuscript from 1193[36] the processing of the parchment equalised the

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[32] *Codices hebraicis*, Part IV, Manuscrit 79 from 1177 (the earliest one), and ms. 84 from 1188/9.

[33] E.g. MS Oxford, CCC 133, unquestionably dating from before the end of the 12th century (see Beit-Arié, *Makings*, p. 138, and in greater detail in the appendix by Zefira Anton-Rokéah, in Beit-Arié, *England*, and ibid., in Plate 10, the characteristics of the hair side are clearly discernible); MS Sassoon 535 (currently in Avigdor Klagsbad's collection) of the French Vitry Maḥzor, which, according to the calendars it includes, seems to have been copied between 1123/4 and 1154/5 (see above, chapter 2, n. 95); MS Vienna, ÖNB, Cod. Hebr. 15 (Schwarz Catalogue 4), possibly inscribed even prior to the 12th century.

[34] See above, n. 32.

[35] See *Codices hebraicis*, Part IV, Manuscrit 85.

[36] Ibid., Manuscrit 91.

sides to the extent that some are indistinguishable and others can be differentiated with great effort, yet they can always be distinguished by touch. The date of the copying of the earliest dated Hebrew manuscript inscribed on equalised parchment was 1226/7.[37] It appears, by its contents, to have been produced in Germany.[38]

Due to the scarcity of indications of the location of production in Ashkenazic manuscripts' colophons, the classification of the dated parchment manuscripts inscribed in Ashkenazic script according to location of production (be it the German lands or France) must be established by means of their contents, mainly on the liturgical rite of prayer books, including the *Haftarot*. The examination of the visual characteristics of the parchment in all localised and localizable Ashkenazic manuscripts reveals a marked difference between the appearance of the parchment of manuscripts produced in the German lands and that of manuscripts produced in northern France. This difference is observed already in thirteenth-century Hebrew manuscripts, and especially in those of the last third of the century. Indeed, it is so consistent and obvious that it can serve as a basic codicological criterion for relating manuscripts from the final third of the thirteenth century to either of the twin regions of the Ashkenazic geo-cultural zone.

Examination of dated manuscripts which are either explicitly localised or localizable based on content or on their copyist's identity shows that in most of the manuscripts produced in France[39] one can distinguish clearly (though sometimes with slight difficulty) between the parchment sides. Remains of hair roots are visible in many of

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[37] MS Oxford MS. Laud. Or. 271 (Neubauer Catalogue 1206).

[38] The manuscript includes a commentary on the piyyutim and it is clear that the editor and copyist was of a family of French Tosaphists; moreover,he also cites French scholars who were his contemporaries. See A. Grossman, 'Perush hapiyyutim le-R. Aharon b. R. Haim HaCohen', in *Aharon Mirsky Jubilee Volume: Essays on Jewish Culture*, ed. Z. Malachi, Lod 1986, pp. 451-468 (in Hebrew). However, according to Prof. Yona Frankel, who examined the manuscript at my request, all the piyyutim commentated by R. Aharon conform to the Western Ashkenazic rite, and are unrelated to the French rite. Therefore, it would appear that the French editor-copyist lived in Germany.

[39] Some fifty in number, twenty-four of which were produced before 1300. The French provenance of ten manuscripts has been surmised based on the square script typical of the French style, which has recently been characterized more distinctly (see E. Engel, 'Remarks on the Ashkenazic Script', in *Specimens of Mediaeval Hebrew Scripts*, vol. 3, Jerusalem 2017, pp xvii-xlvi). The identification of the French script style based on palaeographical parameters has been validated also by the parchment type. We have no information about the quality of the Hebrew manuscripts produced in the region of Alsace – whether the standard type used was equalised parchment as in Germany, or parchment in which the difference between the sides was only reduced.

them, from the earliest manuscript that was copied in France, dated 1215,[40] and until 1395, the year of the final expulsion of the Jews; similarly, they are present in manuscripts copied during the fifteenth century in areas in which Jews were permitted to reside or in areas which had not become part of the French realm at that time. Moreover, in what regards the processing of their parchment, Hebrew manuscripts copied in France can generally be defined in that there are no totally equalised manuscripts among them.[41] Like in Germany, the disparity of the sides had been reduced in northern France, but not to the degree of full equalization. In a sizeable group of French parchment manuscripts from the third decade and the beginning of the fourth decade of the thirteenth century and around 1300, an attempt had obviously been made to level the hair and flesh sides, or to reduce their differences by scraping the sides, which, nevertheless were not fully equalised. In each of these manuscripts the sides are distinguishable, although sometimes with difficulty; in some instances one is able to discern a mix of quires made of equalised parchment along with quires of distinguishable parchment, the bifolia of which would be arranged by matching the parchment sides.

However, as already noted, the earliest dated manuscript made of equalised parchment was produced in 1226/7,[42] apparently in Germany, and most dated manuscripts which were certainly manufactured since 1264 and on in German lands - according to their explicit localisations, or according to textual evidence such as the liturgical tradition - were inscribed on equalised parchment, that is parchment with sides that had been levelled, showing no visible difference. In a handful of manuscripts, most of which date from the third decade of the thirteenth century, we find parchment with reduced differences between the sides, yet the sides are still distinguishable either easily or with some effort. A number of Ashkenazic manuscripts from the end of the fourteenth century and the beginning of the fifteenth century (namely, after the expulsion of the

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[40] MS Vatican Vat. ebr. 468, copied in La Rochelle (לרוקילא) in 1215; yet perhaps the unlocalised manuscript from 1188/9 (*Codices hebraicis*, Part IV, Manuscrit. 84), should be considered the earliest dated manuscript, based on its script (Birnbaum, *Hebrew Scripts*, no. 321, also defined its script as French).

[41] With the exception of one manuscript, MS Vatican Vat. ebr. 482, inscribed on equalised parchment, also in La Rochelle, apparently ca. 1215 (the date did not survive in the colophon, which was inscribed in an intricate micrographic script composed of the letters of the Masora).The same scribe copied MS Vatican Vat. ebr. 468, dated 1215, mentioned in the previous note, on parchment with distinguishable sides.

[42] See above, n. 37.

Jews from France), copied in square script of the German type[43] and presumably manufactured in the German lands, were inscribed on parchment which sides can hardly be differentiated. Hence the assertion that in the German lands there was no parchment which sides had not been equalised to some degree after the last third of the thirteenth century; as a rule the sides were meticulously levelled and only few manuscripts from the last third of the thirteenth century, as well as from the end of the fourteenth century and onwards, show either marked or hardly recognizable differences between the sides.[44]

It seems that parchment with distinguishable sides had always been in use in France, notwithstanding the predilection to reduce differences, especially at the turn of thirteenth century and the beginning of the fourteenth. The few dated manuscripts produced on non-equalised parchment in Germany between 1232/3 and 1257/8 show that the difference between France and Germany emerged, so it seems, only in the second half of the thirteenth century, when equalised parchment was adopted in Germany, while in France non-equalised parchment or parchment with reduced differences between its sides continued to be used. However, there is no doubt that in France as well a shift had occurred in the mode of processing non-equalised parchment. The early parchment in which hair roots were preserved in their entirety and the flesh sides were made smooth and glossy was unlike the parchment used there at the end of the thirteenth century and the beginning of the fourteenth: although non-equalised and with distinguishable sides, the latter showed no pronounced differences between its sides.[45]

The codicological criterion provided by the processing technique of Ashkenazic parchment enables us to distinguish between German and French regions sharing the same bookcraft and script; this criterion proved valid only from the last third of the thirteenth century. Ashkenazic manuscripts produced in France, and especially in

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[43] Only the study of the square script has allowed an apparently clear distinction between France and Germany; not so, for the time being, in what regards the semi-cursive script.

[44] Our inability to distinguish between the sides of the German parchment was in fact a condition shared by the Jewish users of parchment in Germany, at least during the late Middle Ages, as can be concluded from a gloss from the end of the fifteenth or beginning of the sixteenth century to *Seder Haget* by Yaʻaqov Margolis: ואם מסופק לך באיזה צד הבשר ‹שעליו יש לכתוב את הגט› אז קח חתיכה של אותו קלף ותלחלח במים או ברוק ואז מכווץ כווץ הקלף מחמת הלחלוחיות ולעולם נוטה הכוייצה לצד הבשר (cited in Glatzer, 'Aleppo', p. 90). Cf. Bischoff's statement (*Latin Palaeography*, p. 9) that the flesh side is always convex and the hair side concave.

[45] This development still requires further investigation and elaboration.

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Germany, on parchment that fully preserved the differences between its sides attest to their early provenance. They could have been inscribed in France, before the last third of the thirteenth century, or in Germany, before the last quarter of the twelfth century. This said, our data are not sufficient for determining whether in early Germany, before the last quarter of the twelfth century, Hebrew codices were copied on parchment which sides had been differentiated in all aspects or whether, as Latin codicologists contend, equalised parchment had forever been in use there.[46]

Indeed, Latin palaeographers and codicologists have made similar albeit not identical observations. Yet, for the most part, these were not reached through an examination of comprehensive corpora, some being the outcome of impressions and personal experience rather than the results of quantitative analysis. The common view was that in Latin manuscripts and documents there existed a visible difference between 'southern' parchment (Italy, Spain, Southern France) and 'northern' parchment (Germany and Northern France); but all scholars involved in this issue regarded that dissimilarity as the outcome of the geographical division of northern and central Europe as against southern Europe, without associating it with a chronological process.[47]

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[46] Peter Gumbert, in a personal communication, told me that his teacher the palaeographer G.I. Lieftinck had explained to him that as from the 9th century the parchment sides of German manuscripts were usually undistinguishable, while French manuscripts used parchment which sides were distinguishable. Wattenbach (above, n. 30) pp. 116-117, had already noted that Italian and Spanish parchments differed from German and French parchment in that their sides were distinct from one another.

[47] On the comparison of parchment in Ashkenazic and Latin manuscripts produced in the same regions see below in the appendix. For a summing up of the material concerning the differentiation between 'southern' and 'northern' parchment in Latin manuscripts and documents, see L. Santifaller, *Beiträge zur Geschichte der Beschreibstoffe im Mittelalter mit besonderer Berücksichtigung der päpstlichen Kanzlei*, I: *Untersuchungen* (Mitteilungen des Instituts für Österreichische Geschichtsforschung 16, 1) Graz 1953, pp. 80–82. For the opinion that the difference between the two parchment types derives from the different source of the skins – in northern Europe parchment was usually made from calf skins that were scraped on both sides producing an equalised appearance, while in the south parchment was made from the skin of sheep and goats, in which the flesh side was processed more thoroughly than the hair side, see G.S. Ivy, 'The bibliography of the Manuscript Book', in *The English Library before 1700*, ed. F. Wormald & C.E. Wright, London 1958, pp. 32–65. The notion that equalised parchment was derived from calfskin was customaty in England, and such parchment is still commonly called there vellum, an etymologically fitting appellation. However, it is highly doubtful whether calf skin loses the hair roots when processed, as assumed. Parchment makers in Qiryat Moshe in Jerusalem, who process skins for the writing of Tora scrolls, have demonstrated to me how they are able to process calves' skins in a way that preserves the hair roots. Nevertheless, Ivy (ibid., p. 35) presents an unknown recipe for the preparation of parchment, mentioned in a 15th century English manuscript, which falls into two types: the first for preparing *parchmyne* from sheepskin which had only been scraped on the hair side, and another for the preparation of *velyme* from calfskin which must be scraped on both sides in order that an equalised appearance be achieved. A later systematic but very small-scale study by Palma leads to similar conclusions: the parchment of central-northern Europe, unlike that of Italy and parts of France, was processed so as to equalise the sides, see. M. Palma, 'Modifiche di alcuni aspetti materiali della produzione libraria latina nei secoli XII e XIII', *Scrittura e Civiltà*, 12 (1988), p. 123.

The shifts in the processing of Ashkenazic parchment – especially German – were accompanied by a radical change in the ruling techniques that swiftly took over bookmaking both in Germany - where equalised parchment prevailed, and in France - where the standard practice was preserving the natural differences of the skin sides, although in a somewhat reduced measure. The non-equalised parchment was relief ruled by hard point, bifolium by bifolium, unfolded, on the hair side, and the ruling of the horizontal lines was guided by a row of prickings showing on the outer margins only. In fact, it so happened that German manuscripts copied on parchment with indistinguishable sides, as well as French manuscripts inscribed on parchment which sides were still either easily or hardly distinguishable, came to be ruled in coloured ruling, page by page, by a metal plummet guided by rows of prickings which showed on both outer and inner margins. And yet, because the new method of coloured ruling had been adopted in France also by the Hebrew copyists, who did not use fully equalised parchment, one can hardly assume that this method spread only because it was suited to equalised parchment. The details of the technical shift in the practice of Ashkenazic ruling, starting at around mid-thirteenth century, will be presented and discussed in chapter 6 below. As it is, one should mention at this point that the change in the ruling method occurred simultaneously with the adoption of equalised parchment (or parchment with a much reduced difference between its sides), and each of the ruling techniques was suited to the type of parchment to which it was applied. This chronological overlap confirms the impression that the properties of Ashkenazic parchment had undergone changes and development as time went by, and that they had not been static and settled from the earliest times as has been argued by Latin palaeographers.

The visual characteristics of equalised parchment in Hebrew manuscripts produced in Germany (and to a limited extent in France) is remarkably similar to the that of the insular parchment in the earliest Latin manuscripts produced in the British Isles before the end of the 8th century, and in manuscripts dating from the same period which were inscribed on insular parchment in continental scriptoria, reflecting an Anglo-Saxon or Irish influence. This parchment too is relatively thick, it is roughly finished, the marks of the scraping – aimed at eliminating the differences between the sides – are visible on the surfaces of both sides, and indeed the hair and flesh sides are similar in texture and hue. See J. Brown, 'The Distribution and Significance of Membrane Prepared in the Insular Manner', in Brown, *A Palaeographer's View*, pp. 125-139 and esp. pp. 125-126 (where he also comments on the inappropriate use of the term vellum to denote insular parchment, which he therefore prefers to designate as 'membrane').

The use of parchment with distinguishable sides resulted in the fact that in all zones of production the bifolia of each quire were arranged by matched sides, ensuring a homogeneous appearance in each of the codex openings – hair sides facing hair sides, and alternately flesh sides facing flesh sides. Accordingly, when leafing through the manuscript one sees consistent alternations of aspect and colour: the rough aspect of hair residues on the hair side followed by the light and smooth look of the flesh side, and so throughout the codex. This matter concerns quiring practices, to be discussed in the next chapter in the section on 'Ordering parchment bifolia'. The use of equalised parchment provided all the manuscript's openings with an identical appearance. No doubt, the spread of equalised Ashkenazic-German parchment left its mark on book design, attesting to a new aesthetic approach to its production.

Appendix: Comparison of the parchment of Ashkenazic and Latin manuscripts produced in the same areas

One should stress that the visual characterisation of the parchment in Hebrew manuscripts, as devised at the Hebrew Palaeography Project and presented formulaically in the SfarData database, is based on the documentation of the vast majority of the dated Hebrew manuscripts by a number of scholars and students over the course of forty years. As can be expected, a subjective formulaic documentation of a visual phenomenon based on the viewer's impression is liable to lack constancy and and uniformity as years go by. Indeed, the re-examination of the outer aspects of the parchment used in early German and French Hebrew manuscripts confirms this hazard. In order to comprehend the phenomenon revealed by Hebrew manuscripts and its connection to bookcraft in general, and to confirm, refute, or correct the subjective observations and reaffirm or refine their impact on the typologies and chronologies, it would be advisable to compare the conclusions drawn from the examination of the parchment of Hebrew manuscripts with those drawn from the examination of the parchment of Latin manuscripts produced in the same regions at the same time.

For the purpose of comparison I initiated, during the years 2008-2012, a survey together with Nurit Pasternak of some three hundred Latin manuscripts produced in northern France and in the German lands and their environs (such as Bohemia, Moravia, and the Netherlands). Most of them were explicitly localised or had their locality firmly

established. They dated from the twelfth through the fourteenth century, while some were from the ninth through the eleventh century, as well as from the fifteenth century. A number of them were dated, but because of the scarcity of explicitly dated manuscripts in Latin script, some - mostly monastic manuscripts – had been dated based on indirect but reliable evidence.[48]

The manuscripts were located and identified according to the descriptions in catalogues of dated Latin manuscripts, foremost at libraries in Paris, especially the collection at the Bibliothèque Nationale de France, at the British Library in London and at the Austrian National Library in Vienna, as well as at the Bodleian Library in Oxford and at the libraries of Cambridge University (The University Library, Trinity College, Fitzwilliam Museum and Corpus Christi College).[49] In that framework we ourselves examined the parchment of all the selected Latin manuscripts; moreover, at each collection that held a large number of manuscripts that matched the required manuscript profile the appraisal was carried out in one go, within a relatively brief period of time. Due to these advantages the limitations of non-measurable, subjective investigation were much diminished.

The comparative study that we conducted revealed that Latin manuscripts both in France and in the German lands present a reduction of differences in parchment sides, although the time span and scope of the process did not coincide with those documented for Hebrew manuscripts from the same regions. According to the evidence provided by

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[48] The research was supported by the Israel Science Foundation (Grant no. 650/08).

[49] The following are the catalogues of Latin manuscripts which served for our sample. In Parisian libraries: *Catalogue des manuscrits en écriture latine portant des indications de date, de lieu ou de copiste*, vols. 1–4 (vol 1: M.-C. Garand & J. Metman, Musée Condé et bibliothèques parisiennes, Paris 1959; vol. 2: M. Garand, M. Mabille & J. Metman, Bibliothèque nationale, Fonds latin (nos 1 à 8000), Paris 1962; vol. 3: M. Mabille, M.-C. Garand & D. Escudier, Bibliothèque nationale, Fonds latin (nos 8001 à 18613), Paris 1964; vol. 4: M.-C. Garand, M. Mabille & D. Muzerelle, Bibliothèque nationale, Fonds latin (supplément), nouvelles acquisitions latines, petits fonds divers, Paris 1981. We were greatly assisted by Denis Muzerelle, who provided us with a list of the manuscripts from the series' computerized database. In the libraries of England: A.G. Watson, *Catalogue of Dated and Datable Manuscripts c. 700–1600 in the Department of Manuscripts, the British Library*, London 1979; idem, *Catalogue of Dated and Datable Manuscripts c. 435–1600 in Oxford Libraries*, Oxford 1984; P.R. Robinson, *Catalogue of Dated and Datable Manuscripts c. 737–1600 in Cambridge Libraries*, Cambridge 1988. In the Austrian National Library (Österreichische Nationalbibliothek): F. Unterkircher*, Die datierten Handschriften in Wien ausserhalb der Österreichischen Nationalbibliothek bis zum Jahre 1600* (Katalog der datierten Handschriften in lateinischer Schrift in Österreich 5), Vienna 1981, as well as other sources, with the dedicated assistance of Franz Lackner, who also provided us with a list from the computerized database of the Kommission für Schrift- und Buchwesen des Mittelalters of the Austrian Academy of Sciences.

the Latin manuscripts, the beginnings of the new method of processing skins and the production of parchment with reduced differences, almost to the point of equalization of the skin sides, occurred before the time in which these methods became apparent in the dated Ashkenazic manuscripts. Until the eleventh century the parchment produced in the regions of northern France and Germany preserved the natural differences between the sides; but already close the middle of the eleventh century in France and in Belgium, and at least from the second third of the twelfth century in the German lands, a gradual shift began towards using parchment that had been processed so as to render a similar, or almost identical, aspect to both sides.

In a sample of dated manuscripts from northern France and especially from Flanders, the earliest manuscripts inscribed on parchment where differences between the sides had been reduced, generally without leaving residues of hair follicles but still allowing differentiation between the sides - mostly because of the difference in hue and the roughness of the hair sides - derive from the second decade of the eleventh century until the beginning of the twelfth century.[50] The parchment used for these and other Flemish manuscripts seemed to display unique visual traits.

Apart from two codices produced before 1142 (the year in which MS London Add. 15722 was produced, apparently in the Abbey of Citeaux in Eastern France) no manuscripts inscribed on parchment with reduced sides were found in the sample from France proper.[51] One of the two codices was copied on the border of Flanders between 1022 and 1041; the other was the Norman manuscript copied in the year 952 at the

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[50] The manuscripts are MS London Royal 5 A.XI, produced between 1022 and 1041, probably at the Abbey of St. Bertin (in Saint Omer in northern France, bordering on Flanders); MS London Royal 6 A. V, produced in Flanders, Belgium before 1049; MS London Add. 16974 (fols. 114-129), produced in <St. Trand> (Flanders) after 1051; MS London Add. 28106, a renowned large-size illuminated Bible in two volumes copied in Stavelot (Flanders) in 1092-1097; and MS Paris Lat. 2195, copied in Tournai (Flanders) in 1105.

Two earlier manuscripts were MS Cambridge, Corpus Christi College 272, copied in 883-4, apparently in Reims at the Abbey of Saint Remi, with both parchment sides scraped. They can nevertheless be distinguished by their hue, and under a magnifying glass it is often possible to discern remnants of hair follicles; and MS Cambridge, Corpus Christi College 192, copied in 952 at the Celtic Landévennec monastery in Bretagne; here the parchment is entirely equalised, presumably reflecting an Insular tradition that lasted there till the end of the 8th century and later (above, n. 47), as evidenced by the quiring by quinions (see the next chapter), the pricking in both inner and outer margins (below, chapter 5, n. 47), as well as the use of engraving plummet for ruling (ibid., n. 120).

[51] MS Cambridge, Trinity College, B. 16.44, which, according to the evidence of historical circumstances, had been produced at the Norman Abbey between 1059 and 1070, was inscribed on parchment with greatly reduced sides, but remnants of hair follicles still make them distinguishable.

Celtic Landévennec Abbey in Bretagne (mentioned above in n. 50). Indeed, in many of the French manuscripts it is possible to distinguish between the sides either easily or with some effort, yet by the end of the fourteenth century the tendency to equalise the parchment sides had increased. Our examination of the parchment of the Latin manuscripts copied in France demonstrates that its evolution and characteristics are similar to those found in Hebrew manuscripts produced in northern France: until the beginning of the fourteenth century a significant number of manuscripts were inscribed on non-equalised parchment; manuscripts with fully equalised parchment were rare: some of them contained bifolia of non-equalised parchment, while in others the sides can hardly be distinguished, sometimes only by touch.

In the regions of the German lands the earliest among the sampled dated manuscripts that was inscribed on equalised parchment with hardly distinguishable sides was MS Vienna, ÖNB Cod. 1063, produced in St. Florian, Austria in 1134. Among the sampled dated manuscripts originating from German regions, one can discern some manuscripts that were inscribed on entirely equalised parchment as early as the middle of the twelfth century. From the late thirteenth century and onward, most of the manuscripts produced in the German lands and their environs used fully equalised parchment, like the Hebrew manuscripts produced there. Yet one should emphasize that, judging from the residues of hair follicles in the margins of these manuscripts (especially the lower margins), and from the feel of the parchment, it is clear that the copyists themselves distinguished between the sides and arranged the quire bifolia by matching sides (with each opening presenting either hairs sides or flesh sides that faced each other).

As can be expected, many of the Latin manuscripts examined were produced in abbeys, a good number of them splendidly illustrated and decorated. It seems that in France equalised parchment with sides distinguishable only by touch was used already in the sixth decade of the twelfth century to produce Latin manuscripts, mostly the exceptionally lavish, sometimes royal ones, and especially those produced in Paris on superior parchment. These aspects of the production of Latin manuscripts illustrate the need to classify their parchment based not only on the differences between the skin sides but also according to the parchment's thickness, the book genres, and their general quality; this said, it is quite likely that these aspects would undermine the comparison with Hebrew manuscripts. Nevertheless, our sample corroborates most of the findings collected and classified in the formulaic documentation of Ashkenazic

parchment in dated Hebrew manuscripts. The examination of the Latin manuscripts has contributed to our understanding and awareness that the Hebrew copyists who used equalised parchment both in Germany and in France were able to distinguish between the equalised sides and consistently arranged the quire bifolia with matching sides facing each other in the openings, as demonstrated by the hair follicles left in the margins and the texture of the parchment.

Our survey demonstrates that the scraping and removal of hair follicles from the written area only, leaving some in the margins, was common practice. Its occurrence in large in-folio manuscripts (in which all bifolia were produced from a single processed sheet of parchment) may, of course, attest to the fact that parchment-makers did scrape the hair follicles thoroughly, leaving the ones that were at the margins of the sheets that were destined for copying in the folio format; yet the prevalence of this phenomenon also in smaller-format codices, especially in-octavo ones, indicates that the scraping was done after the bifolia had been cut by the copyists according to the planned layout of the writing surface.

Oriental and Yemenite parchment

The oriental parchment is known to us from extant biblical codices produced in the Middle East, especially in the tenth and eleventh century, of which dated exemplars are very few. As mentioned, the use of parchment in the Orient is manifested only in manuscripts produced before 1327; only in Yemen, parchment manuscripts survived from the 1470s and 1480s and the early sixteenth century. The method of preparing parchment in the Orient and in Yemen makes it difficult to distinguish between the hair and flesh sides as both sides are glossy and smooth. No signs of scraping can be discerned on the hair sides, and only rarely do they contain hair residues or visible pores. This said, it is always possible to identify the sides by their hues, the flesh sides being lighter than the hair sides.[52] It is obvious that despite the similarity of the two sides, the manuscripts' makers easily distinguished between them, as demonstrated by the bifolia arrangement and the ruling technique. Yet, it seems likely that the aesthetic

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[52] According to Déroche, *Islamic Codicology*, p. 47, the hair and flesh sides can be distinguished in early Qur'ans (the use of parchment in the Eastern Islamic world was discontinued already in the tenth century) according to the differences of hue and texture – the flesh side is paler than the hair side, which displays a velvety texture. In Abbasid Qur'ans signs of the hair side are discernible in the margins, especially near the edges and around holes. The Jews probably used the Arabic parchment (رَقّ), which is mentioned in the Geonic halakhic literature.

principle that sides of the parchment intended for codices should look as similar as possible dictated this method of parchment processing which was, no doubt, Arabic. As in Germany, so in the Middle East, it appears that book producers or parchment makers sought to provide both sides of the writing support with a similar appearance; yet in Germany (and to a certain extent in France) the resemblance was achieved by scraping the two sides, whereas in the Orient it was achieved by polishing them.

Sefardic parchment

The visual features of the parchment of the three extant manuscripts from the last two decades of the twelfth century in Christian Spain basically resemble those of Italian parchment.[53] However, one ought to note the parchment used for the earliest extant manuscript from the Sefardic zone, copied in the second half of the tenth century or in the first half of the eleventh century (the date in the colophon is damaged) in Kairouan (Tunisia). The parchment of this biblical codex is of the Oriental type, presenting sides that are very similar in appearance: the difference can be discerned mainly by their hues, but no residue of hair roots are visible, except sometimes in the margins, and both sides are smooth and glossy. Due to the paucity of early evidences from North Africa and the absence of early evidences from Spain we are unable to determine whether the oriental-Arabic parchment processing had indeed been used in early times in those areas (or in North Africa alone).[54]

Lacking exact quantitative documentation about the aspect of parchment used in the later periods, from the thirteenth century onward, in Iberia and Provence (the dated parchments from North Africa are too few to be characterised), only a rough characterisation will be offered here. Over time, the appearance of Sefardic parchment changed, as compared to what it had been in early manuscripts, but its sides would still be easily distinguishable: in most cases the hair sides were not scraped and hair follicles would be present. In some manuscripts the hair sides would be scraped, and no

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[53] Babylonian Talmud, the three *Bavot*, copied in Gerona in 1184 is the earliest dated manuscript from Christian Spain (See *Codices hebraicis*, Part IV, Manuscrit 81); a Pentateuch copied in Gerona in 1188 (see ibid., in the Hebrew introduction, p. 11, ms. E); Prophets and Hagiographa, copied in Toledo in 1197/8 (see ibid., Manuscrit 95)

[54] For a description of the manuscript found in Kairouan, see *Codices hebraicis*, Part II, Manuscrit 29. In any case, the parchment in the talmudic manuscript, which was inscribed apparently in North Africa in 1123 (ibid., Part III, ms. 63) is similar in appearance to the three mentioned manuscripts surviving from late 12th century Spain, in presenting a conspicuous difference between the flesh and hair sides, which preserved the hair follicles.

remnants of hair would be found in the entire manuscript or in some of its bifolia. The flesh side is very light and glossy.

Byzantine parchment

It appears that the parchment used in the few parchment manuscripts that are extant from the Byzantine zone bears a similarity to the Italian type, in that its processing retained the natural differences between the two sides, thus allowing a clear differentiation between them. The hair sides show remnants of hair, mostly with no marks of scraping.
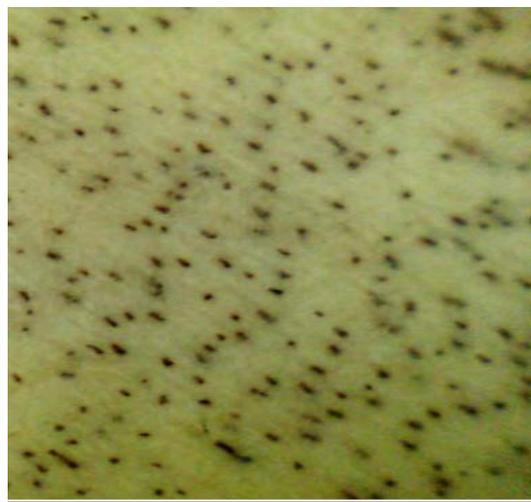
Parchment from a Hebrew manuscript photographed with an electronic microscope

2. Paper

At the outset of this chapter I mentioned that the word נייר in talmudic Hebrew designated the writing support made of papyrus, and that over time it evolved to signify the new support which had spread from China and which is known by this name today. When paper for the copying of Hebrew texts first began to spread out in Italy, the term **נייר** was not used yet for denoting this new writing support. In a sale deeds referring to two paper codices and dated 1284 and in later book-lists the term used was מוך, which, in the Tosefta and Talmud Hebrew meant rags, worn out fabric, or textile chaff (today's 'cotton wool'); in truth, that term was most appropriate for describing paper made of

pounded rags.[55] Indeed, until the second half of the fifteenth century the Hebrew term נייר was absent from Hebrew colophons. At the end of the fifth- and the beginning of the sixth decade of that century the term ניירים (plural of נייר = paper), denoting leaves of paper, appears for the first time in three Byzantine colophons; however, the term נייר appears in no other colophon before 1540. In Judaeo-Arabic book-lists from the Middle East found in the Cairo Geniza the Arabic terms *warq* (ורק) or *qagd* (קאגד) were used,[56] yet these terms are absent from the numerous colophons inscribed in Judaeo-Arabic, despite the fact that by the eleventh century paper had already become the standard writing suport for Hebrew manuscripts in the Eastern Islamic zone.

Paper as writing support was invented in China; its earliest findings come from central China at the age of the Western Han dynasty (206 BCE until 8 CE) – some nine hundred years before the Arabs became acquainted with its production methods. The raw materials of these findings as well as of other paper findings from the years 73-49, 52, 49, and 6 BCE have been identified as fibres produced from a variety of plants, rags, worn out fishing nets and ropes, all of which contained mainly fibres derived from cannabis.[57] It is commonly recounted that the Arabs acquired the knowledge of

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[55] See M. Beit-Arié, 'The Identity of the Kabbalist Menahem Recanati', *Tarbiz*, 67 (1998), pp. 576-577 (in Hebrew).

[56] For these and others terms in Arabic and on the history of Arabic papermaking, see A. Grohmann, *From the World of Arabic Papyri*, Cairo 1952, pp. 49–57. ורק (pl. אוראק) appears in Geniza book-lists. See Allony, *Jewish Library*, as referenced by the index entries. The spelling כאגד (rather than קאגד) appears there a few times.

[57] See Tsuen-Hsuin Tsien, 'Raw Materials for Old Papermaking in China', *Journal of the American Oriental Society*, 93/4 (1973), pp. 510–519; Pan Jixing, 'On the Origin of Papermaking in the Light of Newest Archaeological Discoveries', *Bulletin of the International Association of Paper Historians* (Basel), 2 (1981), pp. 38–48; idem, 'Review on the Debate of Paper History during the Recent 30 Years in China', *Paper History: Journal of the International Association of Paper Historians*, 15,2 (2011), pp. 6-12. I am grateful to Michael Friedrich of Hamburg University for drawing my attention to this updated article relating to the issue of the beginning of papermaking in China. Jixing claims that one should not rely in this matter on literary sources but only on archaeological finds which prove that paper production begun in the second century BCE. Peter Tschudin, a renowned scholar of paper, wrote a general book on paper, a guide of sorts for the educated public, a substantial part of which deals with the later development of paper and its manufacturing technologies: P.F. Tschudin, *Grundzüge der Papiergeschichte* (Bibliothek des Buchwesens 12), Stuttgart 2002. For a comprehensive collection of studies on both Occidental and Oriental paper: *Le papier au Moyen Âge: Histoire et techniques – Actes du colloque international du Centre National de la Recherche Scientifique, Paris, Institut de France, 23, 24 et 25 avril 1998*, ed. M. Zerdoun Bat-Yehouda (Bibliologia 19), Turnhout 1999, and see ibid., the opening summary article by P.F. Tschudin, 'Le développement de la papeterie, de ses débuts en Asie à l'Europe de la Renaissance', pp. 1–16. Another notable book, much of which is devoted to the methodology of research on late Occidental paper and its quantitative characterisation is E. Ornato et al., *La carta occidentale nel tardo Medioevo*, vols. 1–2 (Istituto Centrale per la Patologia del Libro Alfonso Gallo: Addenda 4), Rome 2001. Although this work is based on a small corpus of 15th-century

producing paper in Samarkand from Chinese papermakers who were imprisoned by the enemy in 751 during the Battle of Talas in central Asia (southern Kazakhstan). It seems that this account, notwithstanding its fabulous character, is not far from the historical truth.[58] From Samarkand the production of paper by processing worn linen textiles had spread to other centres in the Middle East and to other Muslim lands in the Maghreb and Iberia. In Christian Europe paper manufacturing began only in the thirteenth century, in Italy.

Oriental (Arabic) and Occidental paper

Based on its visual characteristics - which reflect distinct technologies - medieval paper is divided into two main types: Oriental paper, produced in the Eastern Islamic lands throughout the Middle East and in Western Central Asia, and which, in research literature, used to be called 'Arabic paper' and of late is also called 'Islamic paper'; and Occidental paper, eventually produced in Christian territories, and also called 'European paper'. The Oriental (or Islamic) type had an offshoot in the Maghreb and Andalusia from the eleventh through the thirteenth century, but data about this subtype are scarce. The paper used in Hebrew manuscripts pertains, perforce, to either one of these two types, given the distribution of Hebrew book production in the zones of the two civilisations. Crucially important for Hebrew codicology are the acquaintance with these two types and the ability to distinguish between them and to characterise them in historical perspective; for the type of paper (like the type of parchment) attests, more than any other codicological attribute, to the manuscript's provenance. This information is vital in view of the unique historical circumstances of the Jewish people and its innumerable migrations, as manuscripts were being copied by emigrants who kept up

manuscripts and especially of incunabula (fewer than one hundred), it is methodologically and practically both valuable and innovative due to its multifaceted investigation of paper and its measurements (e.g. measurements of the paper's brightness and transparency). The book also includes a long chapter (vol. 1, pp. 87-274) devoted to the history and research of Occidental paper and, of course to the study of watermarks in particular. The data concerning these various codices and incunabula and the processing of this data are presented only for the fifteenth century and on.

[58] Muhammad Jamil refuted the validity of the various sources regarding the use of paper before the capture of Samarkand, see M.F. Jamil, *Islamic Wirāqah "Stationery" During the Early Middle Ages*', Ph.D Dissertation, University of Michigan, 1985, pp. 99–105. According to him, the traditional accounts are validated by a Chinese source (ibid., p. 108). There is little information about the technology of paper production in the early Abbasid period (which began in 749) and, furthermore, this meagre material is presented in later sources. Jamil points out that the most interesting information in the writings of Ibn Badis (see below) relates to a later technique. On Arabic sources for the beginning of paper production and its diffusion, cf. Amar, 'Paper Industry', pp. 74-75.

the script of their ancestors. Certainly, the paper of which Hebrew manuscripts were made was not exclusive to Hebrew books. It was not unlike the paper used for a variety of manuscripts in Arabic, Persian, Greek, Latin, etc., which were produced in the alien societies amidst which the Jews lived and where paper was manufactured. The documentation of the paper used in Hebrew manuscripts and the processing and analysis of the collected data would seem to add little to the study and growing knowledge of paper and of its development and visual characteristics, amassed since the end of the nineteenth century from manuscripts and documents in Latin, Greek, and Arabic scripts. This is true of Occidental, European paper, and particularly of the paper manufactured in Europe from the end of the thirteenth century onwards, to the description, analysis, and classification of which so many studies have been devoted. The contribution of Hebrew manuscripts to the study of European paper is indeed negligible;[59] however, the value of these manuscripts for the study of paper produced in the Middle East and in Western Central Asia and for its visual typology is great, as until recently no systematic documentation of paper in Oriental Arabic manuscripts has been carried out. Documenting the dated Hebrew manuscripts kept in libraries worldwide, as well processing and analysing their data, have made it possible to put together a tentative typology of the visual morphology of Oriental paper, which was published as early as 1975[60] and has been updated twice since then.[61] In the meanwhile,

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[59] This said, the important methodological contribution of Monique Zerdoun Bat-Yehouda (who for many years was a member of the French team of the Hebrew Palaeography Project) to the study of watermarked Occidental paper is based also on the data from dated Hebrew manuscripts, see Zerdoun Bat-Yehouda, *Papiers filigranés*. Because of the paucity of early dated European Hebrew paper manuscripts, the use of early Occidental paper morphology for the dating of Hebrew manuscripts (and to a certain extent, identify their provenance), based primarily on the spacing of the chain lines and the width of the laid lines, and on zigzag markings (see below in the text referenced by notes 69-72, 75), relies on the study of Latin and Greek manuscripts. One such example is MS Jerusalem Heb. 8° 3941, which contains a corpus of unknown translations to medical treatises by Maimonides (See M. Beit-Arié, 'Unknown Translations of Maimonides' Medical Works', *Kiryat Sefer*, 38 (1962-63), pp. 567-574 (in Hebrew). These translations were inscribed in a Byzantine script on non-watermarked Occidental paper, with external and internal parchment bifolia (on mixed quiring, see below, section 3). The dating of the manuscript is based on the width of the laid lines – 43-45 millimetres (whilst the standard unit of measure in Latin and Greek manuscripts research is the width of twenty lines), and on the spacing of the chain lines – 50-59 millimetres, which are visible through its bifolia – see. M. Beit-Arié, 'A Palaeographical Description of the Jerusalem Hebrew Manuscript', in *Moses Maimonides on the Causes of Symptoms*, ed. J.O. Leibowitz & S. Marcus, Berkeley–Los Angeles–London 1974, p. 36.

[60] Beit-Arié, *Hebrew Codicology*, pp. 26-37.

[61] Beit-Arié, 'The Oriental Arabic Paper', *Gazette du livre médiéval*, 28 (1996), pp. 9–12; Beit-Arié, 'Oriental Paper Patterns' (1999). The latest update was based on 450 dated Hebrew manuscripts copied in the Orient (including the region of Yemen, which, according to the classification used in this book,

additional characterisations of Oriental paper were published, based on the Arabic manuscripts kept at the collections of the Bibliothèque Nationale in France.[62]

Although the documentation of Hebrew manuscripts produced in the Orient was pioneering by virtue of the very undertaking which comprehended all of the dated Oriental paper manuscripts, it did not include all the visual elements of paper that are studied today. This documentation was, in fact, only a small part of the comprehensive documentation of all the codicological characteristics of Hebrew manuscripts, and it was initiated many years before the meticulous research concerned with the characterisation of paper in general and of Oriental paper in particular had developed. Accordingly, it was not awarded the same measure of detail which expert researchers of paper have dedicated to such documentation in recent years. Moreover, there was no way of conceiving of every minute visual detail which researchers discerned later.[63]

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was marked as a codicological sub-type of the Orient) on Oriental paper, and on another 140 dated non-Hebrew manuscripts. They too had been inscribed in the Orient, on Oriental paper, most of them in Arabic, and some in Persian and Syriac. All of them were examined by me in the collections of the Bodleian Library in Oxford. The typology presented below is, too, based on that corpus.

[62] Chiefly the study by Genevieve Humbert, 'Papiers non filigranés', which exhaustively examines the Arabic manuscripts in the Bibliothèque nationale de France (208 different papers). Another of her articles was based on this work: G. Humbert, 'Un papier fabriqué vers 1350 en Egypte', in Zerdoun Bat-Yehouda (ed.), *Papier au Moyen Âge*, pp. 61-73, and another more general paper by her: 'Le manuscrit arabe et ses papiers', in *La tradition manuscrite en écriture arabe*, ed. G. Humbert (*Revue des Mondes Musulmans et de la Méditerranée*, 99–100 [2002]), pp. 56–77. See also the studies by Marie-Thérèse Le Léannec-Bavavéas, based on Greek manuscripts: M.-T. Le Léannec-Bavavéas, 'Zigzag et filigrane sont-ils incompatibles? Enquête dans les manuscrits de la Bibliothèque nationale de France', in Zerdoun Bat-Yehouda (ed.), *Papier au Moyen Âge*, pp. 119-134; idem, 'Les papiers non filigranés médiévaux dans les manuscrits grecs de la Bibliothèque nationale de France', *Scriptorium*, 53 (1999), pp. 275–324, and see the comprehensive bibliography she compiled*: Papiers non filigranés*. A richly illustrated decorative book intended for the lay public, which nevertheless includes an extensive bibliography on Arabic paper and its diffusion is: J.M. Bloom, *Paper before Print: The History and Impact of Paper in the Islamic World*, New Haven – London 2001.

[63] The scope and level of detail of the documentation of the paper can be seen in the questionnaire for documenting non-watermarked (a.k.a 'Oriental') paper formulated by a group of researchers from the Institut de Recherche et d'Histoire des Textes (IRHT) of the Centre National de la Recherche Scientifique (CNRS) in Paris; see M.-T. Le Léannec-Bavavéas & G. Humbert, 'Une méthode de description du papier non filigrané (dit "oriental")', *Gazette du livre médiéval*, 17 (1990), pp. 24–30. This questionnaire included a number of measurable features that were absent from the abbreviated documentation of the Oriental paper in Hebrew manuscripts, such as the width of the laid lines and their orientations (examined in most of the Hebrew manuscripts only before 1280 – see below), measurement of the paper's whiteness, characterisation of the pulp, its transparency, as well as the spaces between the light and dark regions. The chief weakness in the documentation of Hebrew manuscripts is the lack of measurements of the spaces between the chain lines or their groupings, as well as of the width of the laid lines (see below). For a valuable example of a meticulous study comprising multiple parameters is a single survey of 'Arabic-Occidental' (i.e. Spanish) paper, based on 72 Greek manuscripts: P. Canart et al., 'Une enquête sur le papier de type "arabe occidental" ou espagnol non filigrané' in Maniaci & Munafò (eds.), *Book

And yet, the documents in Hebrew script that were preserved in the Cairo Geniza – especially book-lists, and a few letters as well – provide information about the types of paper manufactured in the Middle East and in Muslim countries outside it. Judaeo-Arabic terms relating to paper, such as אלורק (or כאגד/קאגד בגדאדי), found in many instances, as well as דמשקי or ערקי (Baghdadi, Damascene, or Iraqi), are mentioned in the famous book-lists compiled by Nehemiah Allony.[64]

The raw material for the manufacture of paper in the Middle East, in Europe, in Muslim Spain, and in the Maghreb, notwithstanding the visible differences between the types, was one: fibres of hammered rags, garments and textiles - mainly linen; eventually, in the Orient, cotton was used as well and, to a lesser degree, also frayed hemp ropes.[65] All the paper making technologies, whether in the Orient or in Europe, would submerge frames fitted with mesh wires, or straining cloth, in paper pulp. After the pulp dried, the wire patterns would be visible through the paper sheets since the fibres which covered the mesh wires were thinner but denser than the fibres amassed in the spaces between them; consequently they would look more transparent when held up to a light source. The sizing agent used for Oriental paper was starch, soon replaced in Europe by glue from animal source (gelatin).[66] Although the raw material for producing paper was the same all over, from the start of paper production in Europe the manufacturing technology was totally different from that used by the Arabs in the Middle East. This

Materials and Techniques, vol. 2, pp. 313-393 (reprinted in P. Canart, _Études de paléographie et de codicologie_, ed. M.L. Agati & M. D'Agostino [Studi e testi 451], Vatican City 2008, vol. 2, pp. 1001–1081). This study too proposes the formalisation of the description of paper.

[64] See Allony, _Jewish Library_, by index entry.

[65] For the transition to using cotton cloths and textiles instead of linen, seemingly in the course of the tenth century, see the studies cited in Zohar Amar's article, 'Paper Industry', pp. 81-83. The transition occurred in paper manufacturing, in the regions of al-Sham (Syria and Palestine) at least, in the wake of the spread of cotton cultivation in this area. Indeed, microscopic examination of the raw material in 21 documents from Palestine from the 11th century and from the early 12th century found in the Fusṭāṭ Geniza has shown that the material composition of most of them includes cotton fibres in secondary use, see Z. Amar, A. Gorski & I. Neuman, 'Raw Materials in the Paper and Textile Industry in al-Sham during the Middle Ages in Light of an Analysis of Documents from the Cairo Genizah', in _Papers of the 27th Congress of Paper Historians, Duszniki Zdrój – Kraków, Poland 3–10 September 2004_ (IPH Congressbook / IPH-Kongressbuch, 15).

[66] See J. Wiesner, Die mikroskopische Untersuchung des Papiers mit besonderer Berücksichtigung der ältesten orientalischen und europäischen Papiere (Mitteilung aus der Sammlung der Papyrus Erzherzog Rainer 3), Vienna 1887. Wiesner's microscopic analysis is presented in brief in Briquet, Opuscula, pp. 165-166. An early European Hebrew source about the preparation of paper from rags can be found in the commentary by Menaḥem ben Shelomo Me'iri (Provence 1249-1315), Beit ha-beḥira on B. Sota 17a: הוא <הנייר> נעשה מבלאות של בגדים הנקרא קאגד; See S. Abramson, 'Mi-derekh hametargemim min ha'aravit le-'ivrit', _Lešonenu_, 58 (1995), p. 236 (in Hebrew).

difference is manifested in the morphology of the sheets. The morphology of the wire mesh (or straining cloth) onto which the paper pulp in the vats was flattened, namely the forms imprinted in the paper bifolia, discernible when viewed against a light source, are entirely different in the two types of paper.[67] 'Arabic' (i.e. Oriental) paper was first studied by Karabacek, chiefly on the basis of Arabic literary sources.[68] It was Irigoin who, in a series of short innovative articles, pointed out the differences between Oriental and Occidental paper and uncovered the morphology of most aspects of Oriental paper, based especially on Greek manuscripts.[69] Paper producers in the Orient, and seemingly also in the Maghreb, continued to use the basic Chinese technique: the sieves in the papermaking moulds were made of flexible materials – at first probably cloth and later mesh made up of plants (bamboo or reeds) and stitched with horse hairs or silk threads; they were then submerged in vats that contained the pulp. At the first stages of papermaking in the Orient, the frames of the moulds were apparently made of bamboo and later of wood, and the sieves that were laid in them unattached floated when submersed in the pulp. Later on, the sieves would be attached to the frames. Papermakers in Christian Europe replaced the plant-based meshes with stiff, densely packed metal wires that were stitched with thicker metal wires which attached them to the wooden frames. No wonder the marks left by the meshing in Oriental paper bifolia were not straight but bended and faint, as well as irregular, while the marks of meshing in Occidental paper were straight, evident, and regular. Moreover, what affected the look of Occidental paper was the difference in the pulp used in the manufacturing

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[67] See Hunter, Papermaking.

[68] Karabacek, *Arabischer Papier* (and the English translation, which was published more than a century later); Karabacek, *Neue Quellen*. Many bibliographic references to papermaking and its decline in the Arabic world can be found in the work by Ashtor: E. Ashtor, *A Social and Economic History of the Near East in the Middle Ages*, London 1976, pp. 99–100 (no. 342, n. 34), 200, 262 (no. 354, n. 81), 153 (no. 348, n. 55), 307 (no. 368, n. 44). Cf. idem, 'Levantine Sugar Industry in the Later Middle Ages – An Example of Technical Decline', *Israel Oriental Studies*, 7 (1977), pp. 266–277. Here Ashtor describes the flourishing of the paper industry in the Near East up until the end of the 14th century, when cheaper Italian paper flooded the Middle East.

[69] Irigoin, 'Premiers manuscrits grecs' ; idem, 'Les débuts de l'emploi du papier à Byzance', *Byzantische Zeitschrift*, 46 (1953), pp. 314–319; idem, 'Les types de formes utilisés dans l'Orient méditerranéen (Syrie, Égypte) du XIe au XIVe siècle', *Papiergeschichte*, 13 (1963), pp. 18–21; idem et al., 'Papiers orientaux et papiers occidentaux', in *La paléographie grecque et byzantine*, ed. J. Irigoin & J. Bompair (Colloques Internationaux du CNRS 559), Paris 1977, pp. 45–53; idem, 'Papiers orientaux et papiers occidentaux: Les techniques de confection de la feuille', *Bolletino dell'Istituto Centrale per la Patologia del Libro*, 42 (1988), pp. 57–79; Irigoin, 'Papiers non filigranés' ; idem, 'Datation par les filigranes', pp. 13, 15.

process, as the raw material was being shredded in hydraulic mills and not pounded manually, as in the Oriental practice. This shift began in Spain already in the Muslim kingdom of Valencia and persisted after the Christians reconquered Valencia and Catalonia.[70]

The narrowly-spaced lines which can be seen through the paper are called 'laid lines' ('vergeures' in French), and the wide-spaced stitching lines perpendicular to them are called 'chain lines' ('chainettes' in French[71]). The differences between the two types of paper, produced by the mould's sieve, are even more conspicuous in the disposition of the sieve's elements as viewed through the paper: as a rule, in Occidental paper one can always spot single laid and chain lines, being regular and uniformly-spaced; whereas the structure of the mesh lines discerned in Middle Eastern and apparently also Maghrebi paper is highly assorted and attests to the use of different types of strainers that varied from place to place and from one period to the other. There are several types of Oriental paper, distinguishable by their mesh structure: (a) paper in which no meshing can be seen through, a phenomenon that should be attributed to the use of fabric or silk for sifting the water; (b) paper where only laid lines can be seen through; (c) a large group of paper types where both laid and chain lines can be seen through, as would be the case later in Occidental paper, yet – in all types belonging to this group (apart from one which was seldom used) - chain lines are not single, uniformly-spaced lines: instead, they would be clustered in varied groups, not necessarily evenly-spaced, sometimes in two alternating cluster patterns.[72] Later in this chapter a typology of Oriental paper will be presented, based on the documentation of 450 dated Hebrew manuscripts copied on Oriental paper in the Middle East (including Yemen), and another 140 dated manuscripts from the Bodleian Library collection, mostly in Arabic and a few in Persian and Syriac, which were inscribed in that same region.

Paper produced during the eleventh to thirteenth centuries in the Western Islamic territories (Spain and the Maghreb) and in thirteenth-century Christian Spain

As has been indicated, the production of paper in the Islamic West started in Muslim Spain in the eleventh century at the latest, and by the middle of that century the reputation of Andalusian paper for quality had already spread to the Middle East, as

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[70] See Burns, *Society and Documentation* (above, n. 12), pp. 168-169 and the literature survey of prior research cited there.

[71] Until recent years, the French term was *pontiseaux* (little bridges), which is now used to denote the wooden supports underneath the mesh. As for the other terms used in papermaking, see: E.J. Labarre, *Dictionary and Encyclopaedia of Paper and Paper Making with Equivalents in French, German, Dutch, Italian, Spanish and Swedish*[2], Amsterdam 1969.

[72] The '*pontiseaux*' – the wooden supports beneath the wire sieve – imprinted shadings on the paper sheets. In Occidental moulds they were under the chain lines and therefore their shadings overlapped with the chain line. According to Baker, beginning in the 12th century one can discern in Oriental paper shadings spaced 55-85 millimetres apart (and especially 75 millimetres), but they do not overlap with the chain lines because of the different technology (the wire sieve was removed after the production of each sheet). See D. Baker, 'Arab Paper Making', *The Paper Conservator*, 15 (1991), p. 31.

evidenced by letters found in the Geniza. According to Arabic sources, paper mills were set in motion during the tenth century in Tlemçen (Algeria) and Fez (Morocco). No dated Hebrew manuscripts provide us with data regarding the morphology of the mesh used in Muslim Spain, apart from one paper manuscript copied there prior to the thirteenth century: a fragment from a codex produced on paper in Muslim Valencia in 1119,[73] being also the earliest extant dated Hebrew manuscript from the Iberian Peninsula. Its folios show single laid lines and chain lines irregularly spaced (chain lines being 35, 38-40, 45 millimetres apart). Likewise, only one dated Hebrew paper manuscript produced in the Maghreb before the end of the thirteenth century has survived, and no research on Arabic paper manuscripts documents a typology of paper used in that area. Allegedly, the said manuscript was copied in 1125/6 in Zawila al-Mahdiya (Tunisia),[74] yet it is probable that its colophons had been inscribed by its owner rather than by the copyist and therefore it may be that the date of production was earlier. This said, it was inscribed in an Oriental script (by two hands) on paper in which an Oriental type mesh pattern is imprinted.

During the thirteenth century, after the Christian re-conquest of most of the Iberian Peninsula, it seems that the technology of local paper production was already quite similar to the Occidental technology, which had developed over the course of that century in Italy, infiltrating into Christian Spain as well. We know of ten dated Hebrew Sefardic manuscripts (most of them from the Iberian Peninsula and some from North Africa), copied between 1225 and 1303 on paper (or on paper to which parchment bifolia had been attached) that was undoubtedly produced in thirteenth-century Spain. The paper of these manuscripts, like that of non-Hebrew manuscripts copied in Spain and in the Maghreb at the same period, reflects a mesh pattern typical of Spain before Christian Spain adopted the characteristically European paper manufacturing technology. The line patterns in these manuscripts attest, so it would seem, to a blend of Oriental and European technologies: the closely spaced laid lines are coarse but straight, and the single chain lines are quite far apart, separated by uniform or variable spaces (40; 40-45; 45-47; 49; 50; 60-65 millimetres).

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[73] See above, n. 16.

[74] MS St. Petersburg Евр.-Араб. I 4587.

Some of these manuscripts show the most striking distinctive mark of early Spanish paper: 'zigzag marks', shaped like fishbone, engraved with a blunt instrument on the page margins. The nature of these marks is still under debate.[75]

Watermarks in Occidental paper

Watermarks (French: *filigranes*, German: *Wasserzeichen*) embedded in paper produced in the West are the component which best characterises all Occidental paper. These watermarks, which can be seen through the paper sheets, point at individual papermakers and allow their identification. They were impressed onto the paper by the threading of metal wires in a particular shape – sometimes an intricate one - in the mesh that was set within the mould. Gradually, this practice of inserting the producer's mark in the mesh spread from 1282 onward;[76] its presence in occidental paper created highly valuable tools for dating codices made of such paper;[77] by reproducing, by means of a

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[75] Léannec-Bavavéas, 'Zigzag et filigrane' (above, n. 62); J.-L. Estève, 'Observation sur la disposition des vergeures dans les papiers arabo-andalous', *Gazette du livre médéval*, 39 (2001), pp. 48–50; M.-T. Le Léannec-Bavavéas, 'À propos du zigzag', *Gazette du livre médiéval*, 39 (2001), pp. 50–51; J.-L. Estève, 'Zigzag ou vergeures "raboutées" – Le cas du ms. Persan 126 de la Bibliothèque nationale de France', *Gazette du livre médiéval*, 42 (2003), pp. 47–50; P. Canart, 'Il registro notarile di Parente di Stupio: Il segno dello zigzag nel manoscritto', in *Libri & carte – Restauri e analisi diagnostiche*, ed. R. Carrarini & C. Casetti Brach (Istituto Centrale per la Patologia del Libro, Quaderni 1), Rome 2006, pp. 47–53.

[76] The earliest watermark was found by Briquet – the great scholar and compiler of watermarks – in a document from 1282 in the Bologna State Archives (Briquet, *Filigranes*, no. 5410). In 1975 it was reported that three dated leaves from 1271 with a known watermark from the years 1314-1315 had been found in the archives of the Cremona hospital. Irigoin ('Datation par les filigranes', p. 9, n. 4) claims that this is a dated document that was later recopied on later paper with a documented watermark. From time to time one finds in Hebrew manuscripts non-watermarked Occidental paper from the time in which watermarks were already customary. Briquet, in his articles (see Briquet, *Opuscula*) already presented examples and photographs of such Occidental paper, even from the 14th century. Irigoin (ibid., p. 15) mentions this rare phenomenon briefly, noting that either there had been no watermark originally or it had shaken loose of the wires and slipped off. Stevenson, in his introduction to the renewed 1968 edition of of Briquet's watermark corpus notes that sometimes the absence of a watermark is caused by its complete detachment from the sieve, but that this should have left signs of the stitching of the watermark onto it (Briquet, *Filigranes*, vol. 1, p. 22*)

[77] It seems that by the late Middle Ages the fact that watermarks could hold a key to the dating of documents and the legal implications thereof were recognized, as attested in a Jewish source that describes the use of watermarks as evidence in a Gentile court in Germany in the first half of the 15th century. This source was brought to my knowledge by the late Ephraim Kupfer. The following is a citation from Yosef ben Moshe, the disciple of the author of *Terumat ha-Deshen*, in *Leqet Yosher*, which deals with the responsa of Yisra'el Isserlein (Germany, 1390-1460)**:** וזכורני פעם אחת אמר <איסרלין> על הישיבה שהיה שטר שכתוב על הנייר ובא השטר לפני דיניהם והגויי׳ היו מוכיחים שהיה השטר מזויף משום שהיה בנייר צורה אחת כמו שהדרך בכל נייר יש צורה לסימן שמכיר בו איזה אומן שעשאו ואותה צורה שהיה בנייר של שטר אינה זקנ׳ כזמן השטר, כי האומן מן הצורה אינו זקן כמו זמן (J. Freimann, ed., *Leket Joscher des Joseph b. Mose*,

number of techniques, the various watermarks found in dated documents and manuscripts, classifying them, as well as juxtaposing them and watermarks of undated manuscripts.[78] The fact that no watermarks were found in Arabic paper in the Orient

vol. 1, p. 32 cited as an example of a connection to the German legal system also in Y. Dinari, *Ḥakhmei Ashkenaz be-shilhei yemei habeinayim*, Jerusalem 1984, p. 140 [in Hebrew]).

It seems that the first use of watermarks for the dating of a book during the period of Wissenschaft des Judentums, occurs in a very brief anonymous article in French about the printed books in the library of Shelomo David Luzzato, undoubtedly composed by Luzzato himself, as emerges from the use of the grammatical first person. See *Hebräische Bibliographie*, 2 (1859), p. 19 (the article, which begins in volume 1, was written in Padua on May 28, 1848); an image of the watermark was reproduced there (after p. 20). Luzzato describes a watermark (an ox head) observed in a book of *seliḥot*, printed without mention of locality or date of printing, and he comments there (n. 3) on the oxen-head watermarks in the collection of Samuel Sotheby, S.L. Sotheby, *Principia typographica*, vol. 3, London 1858.

[78] Research literature on European watermarks is copious, and several select bibliographies have been published in a number of places, first among which is the bibliography in Part 1 of Briquet, *Filigranes* (1968 edition). For the practical use of the scholar of manuscripts the most important compilations are those of medieval watermarks, primarily that of Briquet, *Filigranes* – the standard corpus containing illustrations of some sixteen thousand watermarks that Briquet collected from tens of thousands of dated documents and which he classified into families of motifs. This system would become the standard classification and remain so to this very day.

A PDF of this corpus is available in the internet https://doc.rero.ch/record/23217/files/ob_447_1.pdf). Apart from this corpus, also notable and useful is the compilation dedicated mainly to the 14th century, V.A. Mošin & S.M. Traljić, *Filigranes des XIIIᵉ et XIVᵉ ss*, Zagreb 1957, 2 vols; as well as the 25-volume series, each volume of which is dedicated to one motif, G. Piccard, *Die Wasserzeichenkartei Piccard im Hauptstaatsarchiv Stuttgart: Findbuch*, Stuttgart 1961–1997. Piccard's vast archive with its enormous contents of approximately 92,000 watermarks is now accessible online from the state archives of Baden-Würtemberg (Baden-Würtemberg Landesarchiv); it contains scans of all the watermarks and has sophisticated search capabilities (e.g. according to watermarks' sizes): http://www.piccard-online.de. For a description of this online archive see P. Rückert, '"Piccard-Online": Die digitale Präsentation von Wasserzeichen als neue Forschungsperspektive', *Gazette du livre médiéval*, 50 (2007), pp. 40–50 (where one also finds a survey of other online collections of watermarks); P. Rückert, J. Godau & G. Maier, *Piccard-Online: Digitale Präsentationen von Wasserzeichen und ihre Nutzung* (Werkhefte der Staatlichen Archivverwaltung Baden-Württemberg, Serie A, Heft 19) Stuttgart 2007. See also, K.T. Weiss, *Handbuch der Wasserzeichenkunde*, Leipzig 1962, as well as Zerdoun Bat-Yehouda, *Papiers filigranés*. The website http://www.memoryofpaper.eu:8080/BernsteinPortal/appl_start.disp is a portal for online compilations of watermarks. It is recommended to use the sophisticated site of the Austrian Academy of Sciences, in which thousands of watermarks from manuscripts in Austrian libraries are being collected, and stored in scans of precise beta-radiography photographs http://www.ksbm.oeaw.ac.at/wz/wzma.php. This website is linked to the main online databases as well as to the bibliographies of the printed corpora.

In using watermarks for the dating of manuscripts one must take into consideration several caveats and difficulties which have been discussed in the research literature, chiefly: the gradual damage to the watermark wire as well as the constant movement of the stitching to the wire sieve, re-stitching and replacement of the wires, which of course resulted in changes to the watermark and hindered the identification of watermarks produced by the same wire sieve (with daily use a wire sieve would last about a year, but with repairs and re-stitching it might last ten years, see E.G. Loeber, *Paper Mould and Mouldmaker*, Amsterdam 1982, p. 5); the production at a paper mill involved using two alternating moulds leading to the creation of twin watermarks which could not be identical either initially or subsequent to changes; the lack of information as to whether watermarks reproduced or referred to in the

(when watermarks started to prevail paper was no longer produced by Arabs in the Maghreb and in Spain)[79] surely provides a simple and convenient indicator for instantly distinguishing between Oriental and European paper, and even for identifying the provenance of a manuscript – whether in the Middle East or in Europe. However, this

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compilations were indeed twin watermarks, and as to the shaping of 'identical' or 'variant' watermarks. Watermarks resembling a watermark in an undated manuscript should be used as an anchor for dating, with a margin of error of at least a quarter of a century, and not necessarily as a precise means of dating, unless they are identical to unique watermarks from unique documents. The existence of different watermarks in one manuscript (analogical watermarks), which was very common in Hebrew paper manuscripts, allows a more precise dating by identifying the time frame common to all identified watermarks. The identification of watermarks must also take into account the disposition of laid and chain lines. According to Briquet, laid lines were very thin and dense in the 13th century, becoming even thinner before 1340, and later replaced by coarser chain lines; the spaces between the chain lines in the 13th century and the beginning of the 14th century were 42-70 millimetres, and during the second half of the 14th century and the 15th century they were 28-40 millimetres; in Italy spaces were wider where watermarks were set, and sometime one finds an additional chain line that supports the watermark (Briquet, *Opuscula*, pp. 315-316). For a recent concise presentation of most aspects of watermark research, including the technological innovations in this field and online databases and a comprehensive bibliography, see *Bull's Head and Mermaid: The History of Paper and Watermarks from the Middle Ages to the Modern Period*, ed. P. Rückert, S. Hodeček & E. Wegner, Stuttgart–Vienna 2009. For data regarding the time range of paper usability, essential for the dating of undated watermarked manuscripts, which - according to Piccard, was *grosso modo* three to four years from 1360 and on - see ibid., pp. 35-37, and in greater detail in A. Haidinger, 'Datier mittelalterlicher Handschriften mittels ihrer Wasserzeichen', *Anzeiger der Phil.-Hist. Klasse*, 139 (2004), pp. 17–20. For the relevance of watermarks for authenticating or disproving dates in colophons, as well as pertinent examples, see my introduction to the Neubauer & Beit-Arié Catalogue, p. xxx [= Beit-Arié, *Makings*. p. 37].

[79] After paper manufacturing came to an end in the Middle East (excluding its north-eastern regions) in the course of the 16th century, Italian paper especially produced for Islamic lands began to be imported there, as from the 17th century at the latest. This paper was thicker than the standard paper and its glue was made of starch rather than from animal source so that it would best resemble Oriental paper. In addition, it contained watermarks designed especially for Muslim clients including, as a rule, three plain or crowned crescents. See F. Babinger, 'Papierhandel und Papierbereitung in der Levant', *Wochenblatt für Papierfabrikation*, 62 (1931), pp. 1215–1219 [= F. Babinger, *Aufsätze und Abhandlungen zur Geschichte Südosteuropas und der Levant* (Südosteuropa-Schriften 3.8), vol. 2, Munich 1966, pp. 127–132]; V. Mošin & M. Grozdanovic-Pajié, '"Crown Star Crescent" Mark and European Export Paper', *Papiergescichte*, 13 (1963), pp. 44–51.

Moshe Gil has discussed the trade in Damascus of paper that was carried to Ramle (Gil, *History of Palestine*, vol. 1, p. 194); he also published Judaeo-Arabic documents from the Cairo Geniza pertaining to this issue, from the years 1057-1058 (ibid., vol. 3, documents nos. 514-517). One letter mentions a special trademark (עלאמה) that producers would impress on the paper: the paper purchased had the '*alama* of Ibn Imām, apparently a papermaker from Damascus. Gil comments: 'apparently a watermark'. See ibid., vol. 3, document no. 514, p. 294, lines 6-7. Prior to that, the same letter had been published by Goitein in an English translation: S.D. Goitein, *Letters of Medieval Jewish Traders*, Princeton 1973, pp. 89–91. Goitein translated the paragraph as follows (ibid., p. 90) '< …> I have issued two bills of exchange on your account <…> as a prepayment on paper with the trademark of Ibn Imām' , where he remarks judiciously (ibid., n. 5): 'Not a watermark in the paper (which is a later invention). It is likely, however, that the name of the manufacturer was stamped on a fly-leaf pasted to the beginning of each roll of paper, similar to the protocol-sheet that preceded all papyrus rolls'.

standard was only partly valid during the fifteenth century and the first half of the sixteenth century, when Italian watermarked paper was imported on a small scale into the Near East.[80] Indeed, some thirty fifteenth- and sixteenth-century dated Hebrew manuscripts produced in the Middle East were inscribed on Occidental watermarked paper, the earliest of them copied in Tel Ya'aqub (near Mardin) in Eastern Turkey in 1416;[81] fifteen such manuscripts were copied in Egypt, Syria and especially Palestine during the fifteenth century, and a similar number were copied during the sixteenth century, before 1540 (which is the upper limit of our codicological documentation), half of them in Palestine. Most of them were copied in Sefardic script by immigrants, most likely from among the Jews expelled from Spain and Portugal.[82]
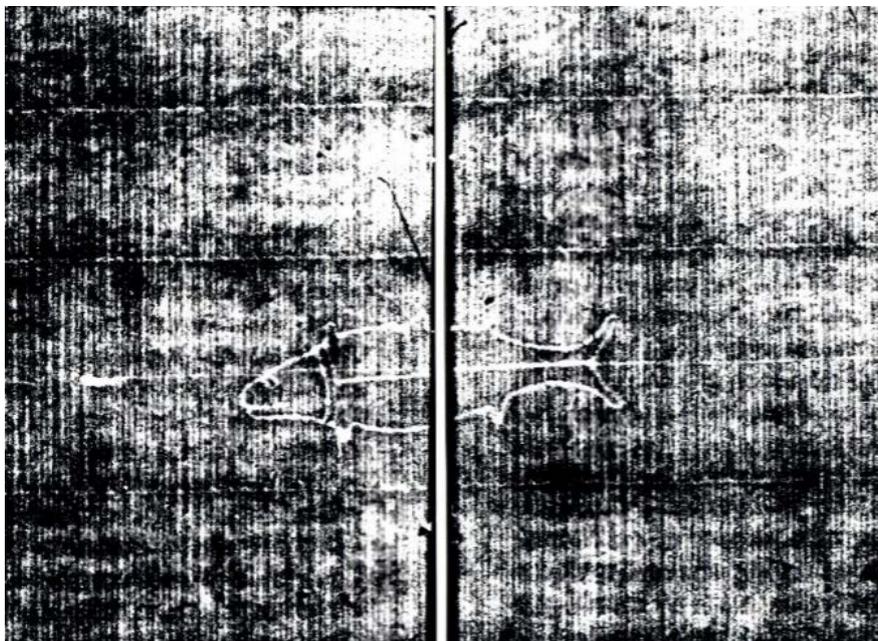
Beta-radiography of a central bifolium with a cleaved watermark in its middle, MS Oxford MS. Hunt 425, fols. 20v^21r. Identical to Briquet no. 12412, corresponding to a document dated 1397

Oriental paper typology according to types of disposition of laid and chain lines

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[80] Ashtor, writing about the Arab paper industry, the rise and fall of which resembled those of the sugar and textile industries, puts forward sources which show that the Venetians began to export paper to Egypt, Turkey, and Syria already at the end of the 14th century, as well as sources about the regular import of paper into the Middle East from the beginning of the 15th century. See Ashtor, 'Levantine Sugar Industry' (above, n. 68), pp. 266-277. See also E. Ashtor, *Levant Trade in Later Middle Ages*, Princeton 1983, p. 210, n. 63, and in the index entry 'paper', van Koningsveld, *Glossary* (above, n. 12) p. 214.

[81] MS Oxford MS. Heb. f.58 (Neubauer and Cowley Catalogue 2821, fols.105-119). Several other manuscripts are described and shown in *Manuscrits médiévaux*, I, 114, 149, 162; II, 73.

[82] These data seem to contradict the sources presented by Ashtor (above, n. 80). The use of Occidental paper in the Near East by immigrants from Spain suggests the hypothesis that the paper may have not been commercially imported but brought there by immigrants from Europe. And perhaps Hebrew scribes from the Orient were reluctant, during the transition period, to use paper to which they were unaccustomed.

The Hebrew Palaeography Project produced a documentation of the visual features of the paper in dated Oriental Hebrew codices kept in all existing collections worldwide; this said, this documentation encompasses only part of the visible aspects and of the components which show through when examined against a source of light. It provides basic morphological information about the laid lines (whether visible, invisible, or barely visible) and the chain lines (ditto, and when visible – their distribution patterns), with no count of the number of laid lines in a given space and without measuring the distances between chain lines. For the early manuscripts produced prior to 1281, the running direction of chain lines in what relates to the codex's height was documented as well, and - in the absence of chain lines - the running pattern of laid lines was documented. In terms of the paper's physical properties, thickness was measured only in these early manuscripts. The phenomenon of paper splitting at the leaves' edges was documented too for manuscripts produced before 1281 as well as for later manuscripts kept in the libraries of St. Petersburg. In what concerns the chemical aspect, the polish of the pages or of their written surface were recorded for all manuscripts. On these two phenomena see below in the sections pertaining to them. The overall codicological documentation of the dated Hebrew manuscripts presents, moreover, data on the dimensions of the folios: these should yield information about the dimensions of the paper bifolia used, which can be compared and examined in what concerns their rapport to the direction of the laid or chain lines, as well as about the ratios of the bifolia's width and length;[83] moreover they would serve for reconstructing the size of the unprocessed sheets of paper as they emerged from the moulds, before being folded and cut into bifolia.

The typology of Oriental paper morphology proposed here is based on a corpus comprising 450 dated Hebrew manuscripts copied in the Orient (including Yemen) on Oriental paper and kept in libraries worldwide. Occasionally the typology would also present select data from 140 dated non-Hebrew codices examined in Oxford's Bodleian Library collections, most of them inscribed in Arabic and some in Persian and Syriac, all produced in the Orient on Oriental paper. The data drawn from the non-Hebrew manuscripts will be shown here only when they attest to the existence of a pattern of

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[83] As presented in reference to the 11th- and 12th-century manuscripts in my introductions to parts 1-4 of *Codices hebraicis*.

disposition of laid or chain lines at a date earlier than that attested by the Hebrew corpus.[84]

The earliest of the 590 manuscripts included in the corpus sustaining this attempt to characterise Oriental paper, particularly from a 'Hebrew' standpoint, is an Arabic manuscript from 978, kept at the Alexandria regional library. In addition, another Arabic manuscript produced before 1000 was examined – MS Oxford MS. Hunt. 228, inscribed in 983. The earliest Hebrew manuscript in this corpus, and indeed the earliest dated Hebrew paper codex, was copied, as mentioned, in 1005.[85]

When the structure of the paper is visible to the naked eye or revealed by various imaging technologies (such as beta-radiography), three main types of paper can be distinguished in these manuscripts: unwired paper with no lines, paper with dense laid lines but with no chain lines, and paper with both laid lines and chain lines clustered, nearly always, according to several types of groups.[86] The differentiation between the types and their kinds would usually be significant chronologically and even geographically; hence the codicological value of these distinctions. In the long run the visual characteristics of Oriental paper underwent transformations, no doubt the product of technological developments that affected its production. In all surviving Hebrew paper manuscripts from before 1079[87] in which a wire pattern can be discerned when the leaves are viewed against a light source, the only discernible lines are dense laid lines with no chain lines.[88] Yet in most Hebrew manuscripts dating between 1085 and 1139/40[89], in which leaves some patterns can be discerned, one observes both laid

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[84] For earlier publications, see above, n. 61.

[85] See above, n. 10, 11.

[86] Indeed, this general subdivision into three main types corresponds to the three types of moulds briefly described by Karabacek (*Arabischer Papier*, p. 53), but he neither enumerated nor characterised the types of chain lines (see Karabacek, *Neue Quellen*, pp. 95-96). The 11th-century North African author, Muʻiz Ibn Badis, in his work on bookcraft described only vaguely the type of moulds used, in a chapter dedicated to papermaking. Karabacek prepared an Arabic edition of this work and translated it into German (*Arabischer Papier*, pp. 84-112). That chapter was translated into French: Briquet, *Opuscula*, pp. 162-170; and into English: Levey, 'Mediaeval Arabic Bookmaking', pp. 5-79; a new translation into French by Geneviève Humbert of the passage concerning the mould was cited by Irigoin in his article 'Papiers non filigranés', pp. 278-280. For other translations, see the bibliography in Le Léannec-Bavaveas, *Papiers non filigranés*, p. 103 n. 207bis*. A critical edition of the entire work in Arabic was published by ʻAbd al-Sattār al-Ḥalwaǧi & ʻAli ʻAbd al-Muhsin Zaki, in *Revue de l'Institut des Manuscrits Arabes*, 17 (1971), pp. 43–172.

[87] These manuscripts are described in *Codices hebraicis*, Parts I-II.

[88] See *Codices hebraicis*, Part II, Manuscrit 33 from 1048. Here and there chain lines, apparently single, are visible.

[89] See the descriptions in *Codices hebraicis*, Part III, the section pertaining to these years.

and chain lines. As we shall see, most types of chain lines are chronologically distinguishable as well, and their differences show especially when a new type of chain lines emerges. Notwithstanding, chain lines of an earlier type would often continue to be used alongside new types.

a. Unwired paper

The absence of any wire pattern in the earliest dated Arabic manuscript known to us, dated 848, may indicate that the early Oriental paper was produced in moulds which used fabric instead of stitched wire mesh to strain the water and dry out the pulp. This type of unwired paper, with no visible laid or chain lines, was in continuous use until the end of the Middle Ages. It is found in manuscripts produced in all regions of the Middle East, but was relatively more diffused in those from Iran and Iraq: almost one fifth of the Hebrew codices in the corpus we use here, produced in those areas, are made of this type of paper.
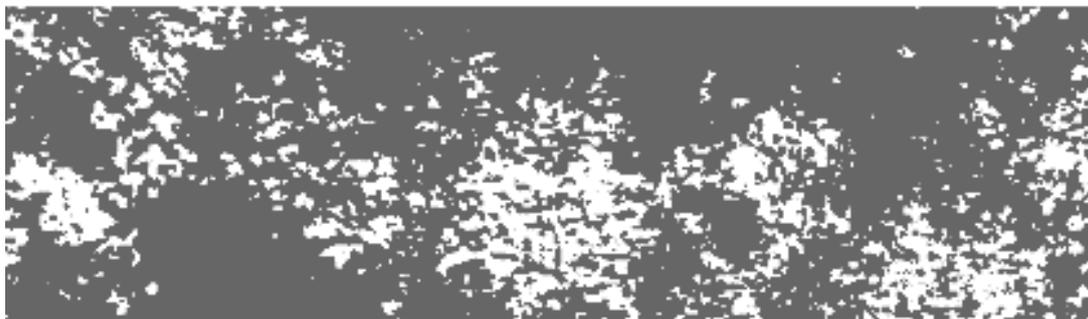
Beta-radiography photograph of the paper in MS Oxford MS. Arab. D. 11, copied in Yemen in 1403

One must emphasize however the existence of another type of paper which does not show wire patterns: it is very differentt in its appearance and quality from the paper described above, and its distribution n is clear and unique in terms of time and space. It is coarse paper, easily identified by its looks: lacking mesh patterns it nevertheless presents fragmented shapes in a singular chaotic arrangement, as well as traces of visible fibres.

In all Hebrew manuscripts produced in Yemen, and exclusively there, this paper was used from the beginning of the fourteenth century and until the last decade of the fifteenth century.[90] It died out with the emergence of Italian paper, which was imported

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[90] According to Ariana D'Ottone's research on the paper of Yemenite manuscripts, Arab copyists used wire-patterned paper as well. She cites evidence of the import of paper from Egypt and Syria to Yemen, see A. D'Ottone, 'La produzione ed il consumo della carta in Yemen (secoli VI–IX H. / A.D. XII–XV) – Primi risultati di una ricerca quantitativa', *Gazette du livre médiéval*, 44 (2004), pp. 39–49; idem, 'La carta in Yemen – Osservazioni sulle provenienze e i materiali', *ibid.,* 45 (2004), pp. 56–58; idem, 'Les

to Yemen from mid-sixteenth century and on. The fact that this type of paper had been in exclusive use in Yemen and in no other region demonstrates it had been produced locally. Indeed, a recipe for the manufacturing of paper inscribed by a Yemenite Arab before 1294 was published recently. According to his instructions, the paper consisted of white fibres from the inner bark of a fig tree.[91] It could well be that not only the type of sieves but also the exceptional raw material used in the production of Yemenite paper account for its unusual texture. Indeed, it stands to reason that the sieves used to produce both the type used chiefly in Iran and Iraq and the type used in Yemen - which did not leave an impression on the paper sheets - were made of fabric rather than of vegetal braided threads.[92]

b. Laid paper

According to the corpus of manuscripts serving as the basis for this typology, paper of the type that shows only dense laid lines running parallel or perpendicular to the folio's height was used since early times. Its earliest appearance in this corpus was in an Arabic manuscript dated 983 (see above). Laid paper, like the type described in the previous section, was manufactured on a regular basis and widely used until 1500. As mentioned,

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manuscrits arabes du Yémen (VIe–IXe / XIIe–XVe siècles) – Quelques remarques codicologiques', *Chroniques yéménites*, 11 (2003), pp. 67–77. See also the details about the distribution of unwired versus wired paper in a corpus she studied of 165 Arabic manuscripts from Yemen dating from the 12th to the 15th centuries: idem, *I manoscritti arabi dello Yemen – Una ricerca codicologica*, Rome 2006, pp. 50–59. The earliest unwired manuscript in her corpus dates from 1179 (*ibid.,* p. 51). Two dated Hebrew paper manuscripts that survived from Yemen prior to the 14th century were produced on Oriental paper: MS St. Petersburg Евр.-Араб. I 4562, inscribed in Aden in 1114 on paper with discernible laid lines and perhaps also chain lines in clusters of two; and MS Berlin Ms. Or. Qu. 568, copied there in an Oriental script in 1222 on paper that shows laid lines. One can assume that from the beginning of the 14th century Jews used only local paper and not the imported Oriental kind, as the former was most certainly cheaper than the latter.

[91] A. Gacek, 'On the Making of Local Paper: A Thirteenth Century Yemeni Recipe', in *La tradition manuscrite en écriture arabe*, ed. G. Humbert *(Revue des Mondes Musulmans et de la Méditerranée*, 99–100 [2002]), pp. 79–93.

[92] Cf. the account of a restorer stating that the ancient mould in Arabic production was a wove mould set in a bamboo frame (H. Loveday, *Islamic Paper – A Study of the Ancient Craft*, [London] 2001, p. 34).

until 1079 all Hebrew paper manuscripts but one, with a clear pattern of wires (whatever their number), showed dense laid lines only, and until 1048 these ran vertically respective to the folio's height. This was the prevalent type of paper in the Orient until circa 1250, declining thereafter with the emergence and diffusion of a new type of paper which showed laid and chain lines of several kinds. This said, approximately one third of the dated Hebrew manuscripts in the second half of the thirteenth century, and about a quarter of them in the fourteenth century were still using laid paper.

Like unwired paper, laid paper was used for the production of manuscripts all over the Middle East. Indeed, many of these were produced in the north-eastern part of that area, namely in Iran, Iraq, and in the neighbouring western part of Central Asia, where laid paper proved to be the prevalent support from the eleventh century and on, and was present in about three-quarters of all Hebrew manuscripts produced there. In fact the absence of wire patterns or of chain lines characterise the paper used (and no doubt manufactured) in those north-eastern areas. Local production of these types continued throughout the sixteenth century and even later. The scant use in those regions of paper which shows chain lines surely attests to a limited import from other countries such as Syria or Egypt.

c. Paper with laid and chain lines

Visible chain lines in Oriental paper are usually grouped in clusters of several types.

c.1 single chain lines [1/1]

> Beta-radiography of Arabic paper
> manuscript
> MS Oxford MS. Poc.110
> Inscribed in the middle East, 1204-1207

Paper manuscripts showing single chain lines - like those in Western paper - are extremely rare, with chain lines that are often curved and unevenly spaced. This type occurs in four dated Hebrew manuscripts only: the earliest dates from 1048 and the latest from 1122. Spaces between chain lines run from 30 to 50 millimetres:

30 or 35 millimetres in the 1048 manuscript, which sometimes seems to show single chain lines;[93] 33-42 millimetres in the manuscript dating from 1106;[94] 35-37 millimetres in one manuscript from 1122;[95] 35-50 millimetres in another manuscript from the same year copied in Alexandria by a Maghrebi scribe.[96]

In this context, one should remark on the type of paper of Maimonides' autographs. Of Maimonides' Judaeo-Arabic commentary to the Mishna, completed in Egypt in 1167/8,[97] four volumes containing five *sedarim* (Orders of the Mishna) have survived in his handwriting. But not all four volumes were inscribed on identical paper: the first two volumes (MS Oxford MS. Hunt. 117 and MS Jerusalem Heb. 4° 5703/1) were copied on paper with single chain lines spaced 52-56 millimetres apart, while the last two volumes (MS Oxford Poc. 295and MS Jerusalem Heb. 4° 5703/2) were copied on Oriental paper with laid lines only. Indeed, the dated Oriental manuscripts mentioned show single chain lines resembling those in the two first autographed Maimonides' volumes, but in Arabic manuscripts much denser chain lines have been documented.[98]

One should consider the hypothesis that the source of the paper with less densely spaced single chain lines – and perhaps of all uncommon papers with single chain lines – was in the Maghreb.

c.2. Grouped chain lines

The type of paper showing grouped chain lines appears for the first time in manuscripts of our corpus at the beginning of the twelfth century, and perhaps

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[93] See *Codices hebraicis*, Part II, Manuscrit 33.

[94] Ibid*.,* Part III, Manuscrit 49.

[95] Ibid*.,* Part III, Manuscrit 61.

[96] Ibid*.,* Part III, Manuscrit 60.

[97] According to the commentary's colophon at the end of the order of Taharot, which did not survive in his hand, Maimonides spent seven years on the commentary and completed it in 1167/8 in Egypt, where he settled after he had left Fez in 1165.

[98] Compare the spacing of the chain lines presented above in the section on 'Paper produced between the eleventh and thirteenth century in the Western Muslim countries (in Spain and the Maghreb) and in thirteenth- century Christian Spain'. Humbert ('Papiers non filigranés') noted that the average spacing of single chain lines she found in the Arabic manuscripts of the Bibliothèque nationale de France was 25 millimetres, and in a small group of manuscripts the average spacing was 30-35 millimeters. Similarly, in some Arabic manuscripts which I myself examined the chain lines were found to be densely spaced, as for instance MS Oxford MS. Poc. 110 dated 1204-1207 (15-18 millimetres) and MS Oxford MS. Hunt. 125 dated 1231 (15-17 millimetres).

somewhat earlier.[99] Gradually its use increased, until it equaled that of the laid-lines-only paper. Grouped-chain-line paper was hardly found in manuscripts produced in Iraq, Iran or in nearby western areas of Central Asia, and never in Yemen later than the beginning of the fourteenth century. Everything indicates that it was produced and used in the western parts of the Near East - Syria, Palestine and Egypt.

In light of Humbert's findings in her article 'Papiers non filigranés', the types detailed below do not exhaust all the distributions of chain line groupings, and it may be that certain variations were not observed in Hebrew manuscripts or were perceived as a non-regular distribution. Her findings and the spacing she measured between clusters are included below.
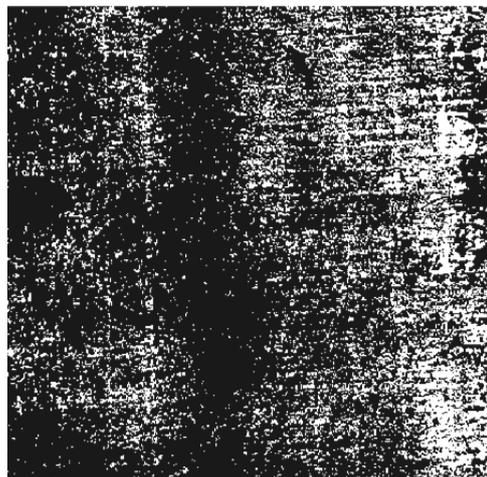
c2. (a) Chain lines clustered in pairs [2/2]

This is the earliest type of the 'clustered' kinds of Oriental paper. Its first appearance

in Hebrew manuscripts and in a selection of Arabic manuscripts in our corpus dates to 1113-1114.[100] According to the Hebrew manuscripts, its peak usage seems to have been in the second half of the fourteenth century. According to the localities in which the manuscripts were used and the style of the script in paper manuscripts with chain lines clustered in pairs, it appears to have been manufactured and consumed in the southwestern regions of the Middle East.[101]

c2. (b) Chain lines clustered in threes [3/3]

A type which emerged, so it seems, in the early thirteenth century, although in our corpus its earliest clear pattern was

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[99] Humbert ('Papiers non filigranés') noticed one of the grouped chain line types in a manuscript from mid-11th century.

[100] *Codices hebraicis*, Part III, Manuscrit 55 (the pairs of chain lines are visible only in some of the manuscripts' bifolia).

[101] Indeed, Humbert believes that the source of the sieves with chain lines grouped in twos is Egypt, see her article devoted to such sieves, 'Un papier fabriqué vers 1350 en Egypte' (above, n. 62).

not found before 1249.[102] However, Humbert discerned this structure already in a manuscript from 1058, affirming it was the most prevalent among the Oriental types of paper of the Arabic manuscripts in the Bibliothèque nationale de France.[103] This said, it became widely diffused only later, outnumbering other types of paper used in the western Middle East during the fifteenth and the first half of the sixteenth century, when it remained the only type of chained paper.

c2. (c) Chain lines in alternating clusters of twos and threes [2/3]
This youngest type is attested for the first time in our corpus in an Arabic manuscript dated 1338.[104] It was noticed however in an earlier Arabic manuscript dating from 1304.[105] Only in the second half of the fourteenth century did its diffusion

Beta-radiography image of the paper in Arabic MS JerusalemYah. Ms. Ar. 306 <Syria?>, 1398/9

article 'Papiers non filigranés' Humbert noted other combinations of chain line groupings: clusters with chain lines grouped in twos (and in a few manuscripts, threes) alternating with single chain lines, as well as clusters of chain lines joined to other clusters but not necessarily in an alternating pattern. Le Léannec-Bavavéas[106] documented clustering combinations of three and two non-alternating

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[102] MS St. Petersburg Евр.-Араб. I 3911, written in Cairo and containing bifolia with chain lines grouped in twos. Irigoin notes an Arabic manuscript from 1247, see his article 'Les types de formes utilisés dans l'Orient' (above, n. 69), p. 20.

[103] This is the only 11th century manuscript in her corpus, and it contains only two manuscripts from the 12th century. It should be noted that irregular chain lines grouped in threes are visible here and there in a few Hebrew manuscripts after 1122.

[104] MS Oxford MS. Arab. d. 223.

[105] See Baker, 'Arab Paper Making' (above, n. 72), p. 31 (the manuscript has been offered for purchase in a public auction). Le Léannec-Bavaveas found the alternating type in a 1314 manuscript, see her article 'Les papiers non filigranés' (above, n. 62), p. 279.

[106] In her article 'Les papiers non filigranés' (ibid.) She too classified the types of chain lines following the classification we used; however, she did not notice paper without any chain lines.

chain lines but with a symmetrical distribution: 3/2/2/3.[107] One cannot rule out the possibility that some the Hebrew manuscripts in which the structure of the chain lines is unclear and which show different clusterings belong to this type.

c2. (d) Chain lines clustered in fours or fives [4/4; 5/5]

This unusual type has so far been noticed, yet with no certainty, in a few Hebrew manuscripts dating from the fourteenth and fifteenth century and clearly only in one Arabic codex, dated 1210; it also appears in other, undated, Arabic manuscripts.[108] Humbert has documented three Arabic manuscripts from the end of the fourteenth and beginning of the fifteenth century, two of them from Baghdad and one from Shiraz, showing chain lines grouped in fives.

The scarce occurrence of this clustering indicates that it was used on a limited, locally produced scale, perhaps only in the periphery (apparently Iraq or Iran).

Splitted paper at the folios' edges

A phenomenon which puzzles researchers of Oriental paper is the peculiar splitting of the corners and edges of its bifolia. This feature, for which a definite explanation is still lacking, is frequently observed in many recently recorded Arabic and Hebrew manuscripts from the Middle East, both the Arabic ones of the Bodleian Library, and the Hebrew codices of St. Petersburg. Among the latter, which were studied more thoroughly, 146 (40%) were found to show splitting, or rather splittable edges. In some cases, the edges, mainly external corners, were split into three layers.

This splitting can be seen in paper manuscripts as early as the eleventh century until the end of the Middle Ages, yet it does not seem to characterise unwired paper, including the peculiar Yemenite type. This fact may rebut the prevalent suggestion

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[107] It should be noted that in a photograph of an Indian mould (presumably a modern one) appearing in Hunter's books, one can observe clusters of three chains with clusters of two chains at the edges of the mould. See Hunter, *Papermaking*, p. 88, plate 54.

[108] MS Oxford MS. Marsh. 338, a few bifolia of which have a pinkish hue. This structure is also clearly visible in the pinkish bifolia of two undated Arabic manuscripts, MS Jerusalem Yah. Ms. Ar. 15 (vol. 1) and MS Ar. 885.

that such paper was manufactured by pasting two sheets together.[109] Indeed, the French group of scholars involved in documenting non-watermarked paper in Paris[110] noticed two types of splittable paper: the first was produced by pasted leaves (feuillets collés), showing sieve imprints on both sides,[111] and the second - by double leaves (feuillets démariés), caused by the physical doubling of the pulp in a single mould, and hence showing a sieve imprint only on one side of the sheet.[112] However, in attempting to solve the puzzle of splitting, or splittable, Oriental paper one should take note of the fact that a similar phenomenon is also observed in a few Hebrew manuscripts in early twelfth-century Muslim Spain,[113] and in thirteenth-century Italy and Byzantium. This feature should therefore be studied in juxtaposition with the Occidental-Arabic (Spanish) paper and the pre-watermarked Italian paper.

Byzantium – between East and West

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[109] Information of this type was already communicated in medieval Arabic sources. See Karabacek, *Arabischer Papier*, pp. 140-141 (p. 53 in the English translation). The possibility that two paper bifolia were pasted together with starch is mentioned in an article on calligraphy by a 15th century Persian author, see the English translation in W.M. Thackston, 'Treatise on Calligraphic Arts: A Disquisition on Paper, Colors, Inks and Pens by Simi of Nishapur', in *Intellectual Studies on Islam – Essays Written in Honor of Martin B. Dickson*, ed. M.M. Mazzaoui & V.B. Moreen, Salt Lake City 1990, p. 221. This possibility is also mentioned in the research literature: Irigoin, 'Datation par les filigranes', p. 15; H. Gachet, 'Papier et parchemin', *IPH Information*, 16 (1982), pp. 36–41; J. Pedersen, *The Arabic Book*, transl. G. French, Princeton 1984, p. 66.

[110] On this research group and the questionnaire it formulated, see above, n. 63

[111] In his article 'Papier et parchemin' (above, n. 109) Gachet notes that the earliest dated Arabic manuscript kept in Europe (MS Leiden, Universiteitsbibliothek Or. 298, from 865 has two layers, and it was produced by pasting two leaves which were burnished only on their exterior sides.

[112] According to a hypothesis put forward by Irigoin in his article, 'Papiers non filigranés' pp. 289-294. Irigoin wishes to prove that Ibn Badis' description aptly describes a floating sieve. According to Irigoin the splitting of Oriental paper was a result of using a floating sieve (which he believes was not made of plant sources but of cloth): with this technique the paper pulp dries within the floating sieve itself, and the handling of the pulp after it has dried is the cause of the splitting (*ibid.,* p. 293). Data on double-leaved paper (démarié) with or without wire patterns, in Yemenite manuscripts, is presented by Arianna D'Ottone in her book on Yemenite Arabic manuscripts (above, n. 90), pp. 52-53. This information is inconsistent with the data presented by the Hebrew manuscripts. According to the documentation, apart from two manuscripts written in Yemen on Oriental paper before the 14th century (see above, n. 90) no splitting of paper whatsoever was observed in the manuscripts written there, nor even in the manuscripts written on unwired paper in other regions of the Orient.

[113] In the earliest dated manuscript from the Iberian Peninsula (see above, n. 16), written in Valencia in 1119 on paper presumably manufactured in Muslim Spain.

As regards the regional distribution of the two main types of paper – the Oriental ('Arabic') paper and the Occidental (European) one – a short comment should be added concerning the type of paper used in the border zone between Orient and Occident and between Islam and Western Christianity, namely Byzantium. The two earliest Hebrew paper manuscripts from the Byzantine region, copied in 1207 and in the subsequent year by the same scribe,[114] are made of Oriental paper without chain lines. All other extant Hebrew paper manuscripts from Byzantium were copied on watermarked Occidental paper and date from the 1320s and on. These data do not contradict the many findings observed in Greek Byzantine paper manuscripts and documents, although they are not identical. According to Irigoin,[115] Oriental paper was used in the Byzantine zone until Occidental (Italian) paper began to be imported there, after its production had been consolidated, namely from the middle of the thirteenth century. Then it gradually substituted Oriental paper, which disappeared from Byzantium entirely toward the end of the fourteenth century. It seems that all Hebrew copyists, with no exception, preferred using Occidental paper already at the beginning of the fourteenth century.

Sizing and burnishing the surfaces of the paper pages

In addition to the differences in wire patterns that are imprinted in the paper, another difference in what concerns the external appearance of the paper's surfaces is found in Hebrew manuscripts. This difference results from the final stage of papermaking – the sizing and burnishing that render the writing material smooth and glossy, protecting it from ink corrosion and facilitating the smooth flow of the pen. In this respect Hebrew manuscripts are divided in two main groups – the Oriental-Sefardic group and the Ashkenazic-Italian-Byzantine group. This division corresponds to the division separating the zones of Islamic civilisation in the East, and partly in the West, from those of Christian civilisation. In manuscripts from the Middle East (excepting those of worn paper, like many of the fragmented manuscripts of the genizas) and in a significant number (between a quarter and a third, the rate increasing in the second half of the fifteenth century) of paper manuscripts copied in Iberia and North Africa or by Sefardic

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[114] See above in the text referenced by note 22 and in the note.
[115] Irigoin, 'Premiers manuscrits grecs'.

copyists in Italy and Byzantium, the paper surfaces are quite smooth and glossy. In Byzantium a quarter of the manuscripts are inscribed on glossy paper, but only one tenth of them are by Byzantine copyists, the rest having been copied by Sefardic scribes. In contrast, in the Ashkenazic zones (invariably) and in Italy (almost invariably, with the exception of fifteenth-century manuscripts copied by Sefardic immigrants), no glossing is apparent; the paper surfaces are unsized and remain somewhat rough.[116] Within the group produced in Islamic territories, a difference can be discerned in the burnishing method and the paper's appearance between manuscripts produced in the Middle East and those produced in the Sefardic zones. The paper in the Muslim Orient, when well preserved, is very glossy. The gloss is uniform and it covers the entire surface of the paper, indicating that the sizing was part of the process of producing the paper sheets and not a result of a post-manufacture finishing process. The paper used in the Occident was not as glossy. In a small portion of Sefardic manuscripts, apparently not prior to 1435, only the written area was burnished, and in a larger portion – close to one tenth – the paper's lustre forms burnished stripes. Interestingly, the lustre of the stripes, obviously achieved by polishing the paper with smooth stones, appears for the first time in fourteenth-century Byzantine manuscripts, at a scale almost equal to that of its incidence in Sefardic manuscripts. The differences in the appearance of the paper surfaces derive from the liquids used for gluing the raw materials comprised in the paper sheets and their application during the manufacturing process,[117] as well as from the method of the burnishing.[118] The burnishing of the written space alone, including

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[116] See Glatzer's article (printed before all the data were collected): M. Glatzer, 'D'après des manuscrits hébreux, le stade final de la fabrication du papier et la recluse à l'aide d'un cadre', *La paléographie hébraïque médiévale – Actes du colloque international tenu à Paris du 11 au 13 septembre 1972* (Colloques internationaux du Centre National de la Recherche Scientifique 547), Paris 1974, pp. 51–53.

[117] As mentioned, starch was used in the making of Oriental paper, whereas an animal-based glue (gelatin) was used in the making of Occidental paper. See Irigoin, 'Premiers manuscrits grecs', p. 194. Ibn Badis mentions the use of limestone in the gluing process, and see the English translation of his work in Levey, 'Mediaeval Arabic Bookmaking', pp. 39-40. Starch was also used in early Spanish papermaking, as noted by Valls i Subirà in his book *Paper and Watermarks in Catalonia* (above, n. 12). According to Hunter the gluing process in the Orient took place during the sizing, while in the West it took place during the soaking. Ibn Badis mentions both methods (Hunter, *Papermaking*, p. 194 ff.)

[118] According to one of the manuscripts of the treatise by Ibn Badis, who lived in North Africa and whose writings may therefore reflect the technique used in the Maghreb in the 11th century, the final stage of papermaking was the polishing of the paper with hard and smooth stones. See Karabacke, *Neue Quellen*, pp. 101-102. For a similar technique in Spain, see Valls i Subirà, *ibid.,*

the stripe-patterned lustering, indicates that these finishing processes were not integral to the manufacturing process but were performed by the scribes prior to copying.[119]

3. Combination of paper and parchment (mixed quiring)

קודם פטירתו <של ר׳ ירחמיאל> ציוה להביא לפניו את ספר המרדכי. ישב על המטה ובדק הגהותיו שכתב על הספר. הגהות שכתב על הדפים שהיו של נייר רובן מחק, הגהות שכתב על הדפים שהיו של קלף קיים. שאלו בני ביתו, מה טעם מחק אלו וקיים אלו. אמר להם, אינה דומה כתיבה על הנייר לכתיבה על הקלף, הנייר נוח לכתיבה, חידש אדם דבר עד שלא בדק את החידוש כבר ידו נמשכת לכתוב. מה שאין כן הקלף, שצריך אומנות מרובה כדי לכתוב עליו ואין כותבים אלא אם כן בודקים כל תיבה קודם לכתיבתה. עניין נייר וקלף כך הוא, כל שלושה דפים שבספר של נייר היו ודף רביעי של קלף היה.

S.Y. Agnon, 'Hayeraḥme'elim', *Qorot bateinu*, Jerusalem and Tel Aviv, 1979, pp. 60-61[120]

The transition from parchment to paper as writing support in regions outside the Middle East is manifested instructively in manuscripts made of both materials at the same time. Indeed, paper gradually substituted parchment as the main writing support, yet in many manuscripts, excluding Ashkenazic ones, paper quires were wrapped up in parchment bifolia. Usually, these mixed quires would consist of an outer and central bifolium of parchment, between which paper bifolia would be inserted, folded together to form a quire (see in the next chapter on quiring). In this manner, the first and last folios as well as the quire's central bifolium were made of parchment, while the rest were paper folios.[121] This kind of quiring was a way to balance the advantages and disadvantages of paper as against parchment: paper being cheap yet fragile, and parchment being expensive yet sturdy. The parchment bifolia wrapping up the paper bifolia in mixed quires protected them from wear at the outer and inner fold of the central opening, and especially from damage to the outer and central bifolia due to tight stitching of the quires.[122] In one fifth of the manuscripts with mixed quires (36% in Byzantium) only outer parchment bifolia show in all or in part of the quires; this occurs also in the earliest mixed-quire manuscripts. In some, only central parchment bifolia were inserted.

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[119] For scientific tests performed on the reddish hue of Oriental papers from the Geniza when seen against a light source, see V. Rouchon et al., 'Tonalité rouge des papiers anciens observés en lumière transmise: De l'observation à l'interprétation par un modèle de diffusion', in Zerdoun Bat-Yehouda & Bourlet (eds.), *Les matériaux du livre*, pp. 55-70.

[120] Yehoshuʻa Mondshein drew my attention to this passage.

[121] On this phenomenon in Latin and Greek manuscripts, according to catalogues of dated manuscripts and in Hebrew manuscripts (according to the data existing at that in time in the database of the Hebrew Palaeography Project and which were shared with the article's authors) and in several Arabic manuscripts, see F. Bianchi et al., 'Une recherche sur les manuscrits à cahiers mixtes', *Scriptorium*, 48 (1994), pp. 259–286. On the phenomenon in Greek manuscripts, cf. J. Irigoin, 'Les cahiers des manuscrits grecs', in Hoffmann (ed), *Codicologie comparée*, pp. 11-13.

[122] In one of the latest Western manuscripts written on papyrus (from the 7th or 8th century) the external and central bifolia of the quires were made of parchment. See Bischoff, *Latin Palaeography*, p. 8.

The spread of the practice of mixed quiring would depend, of course, on the appearance of paper and the extent of its diffusion in each region. Surprisingly, in the Middle East - the very region where paper became the standard writing support as early as the eleventh century - mixed quiring had never been adopted. Similarly, the technique of mixed quiring was never used in Ashkenaz, where the use of paper spread only in the fifteenth century.[123] The geo-cultural zones of Hebrew book production in which this practice was widespread during the fourteenth and fifteenth centuries were Italy, Byzantium, and Spain. In Italy around half of the small group of dated manuscripts copied in the fourteenth century on paper were made of mixed quires. Mixed quires were used in 16% of the hundreds of Italian paper manuscripts surviving from the fifteenth century. In fourteenth-century Spain this practice is manifested in a third of the paper manuscripts produced there, while in the fifteenth century - from which many paper manuscripts survive - the proportion of those with mixed quires shrinked to one tenth. One third of the paper manuscripts copied in Byzantium during the fourteenth century were composed of mixed quires, dwindling to nearly one quarter in the fifteenth century (24%).

Oddly, the earliest Hebrew manuscript with mixed quiring was copied in 1212 in נא אמון – Alexandria (Egypt)[124] – in an area where such practice was absolutely unknown. However, this manuscript should not be regarded as a specimen of Oriental bookcraft but rather of the Byzantine one, as evidenced by its scripts and codicological features and, apparently, as well as by its copyists and its contents.[125] The earliest paper

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[123] An exception among the dated Ashkenazic manuscripts is MS Berlin Ms. Or. 2° 120, copied in 1436 without an indication of locality in a typical Ashkenazic script and exhibiting Ashkenazic codicological traits.

[124] MS Frankfurt am Main, UB hebr. 4° 2; See E. Róth & L. Prijs, *Hebräische Handschriften*, vol. 1a (Verzeichnis der orientalischen Handschriften in Deutschland 6), Wiesbaden 1982, no. 3. In most of its quires (fols. 1-166) the external and central bifolia are made of parchment, but in its final section (fols.167-210) only the external bifolium of each quire is of parchment.

[125] The manuscript contains a commentary on the midrash *Sifra* by Hillel ben Elyaqim inscribed by two copyists in Byzantine script. The senior of the two, Yeḥi'el ben Elyaqim, may have been the author's brother. The manuscript's bookcraft – apart, of course, from the use of local paper – shows no Oriental features. The author's Byzantine origins may perhaps be deduced from the fact that no other manuscripts of this commentary survive apart from a late Byzantine copy dated 1520 of this very manuscript (MS Oxford MS. Hunt 400, Neubauer Catalogue 427), in which colophon the senior scribe noted: כי היה הספר שהעתקתי ממנו מזמן דתתקע״ב ליצירה וכבר נמחק רובו וחסתי על כבוד מחברו שלא יאבד מישראל <...> כי חשבתי שאין אחר כמוהו. That scribe has been identified with a famous rabbinic judge (*dayyan*) from Fusṭāṭ (first identified by Shakhna Kolidetzky in his introduction to his edition of the commentary, *Sifra de-bay Rav*, Jerusalem 1960, section 10, n. 67 [in Hebrew]). The examination of the many documents from the Geniza inscribed in his hand (see recently, M.A Friedman, 'R. Yeḥi'el b. Elyakim's Responsum Permitting the

manuscripts produced in zones where the mixed-quiring technique was practiced were indeed those in which parchment and paper were combined. The earliest extant mixed-quire codex from Spain dates from 1225.[126] The two earliest such manuscripts from Italy (with outer protective parchment bifolia only, like the Oriental and Spanish manuscripts mentioned earlier) were produced in Rome by the one same copyist in 1311/2 (in one of the two manuscripts there is no mention of the month and therefore it may have been completed already in 1311,[127] while the second was colophoned in 1312[128]). However the script in these manuscripts is not Italian but a Sefardic-type script with Byzantine elements, and it is clear that their copyist was not local.[129] The earliest mixed-quire manuscripts with Italian script are dated 1330 and 1331, both produced by the same scribe.[130] A mixed-quire manuscript copied in the Byzantine zone[131] survives from the same year, 1331, but one should keep in mind that the earliest manuscript showing the same technique, copied in Alexandria in 1212, is Byzantine.

reshut', in *Mas'at Moshe: Studies in Jewish and Islamic Culture Presented to Moshe Gil*, ed. E. Fleischer, M.A. Friedman & J.A. Kraemer), Jerusalem 1998, pp. 328-367 [in Hebrew]) shows that they were in a script that was very similar to that of Yeḥi'el b. Elyaqim, and that therefore the senior copyist should be identified with the *dayyan* from Fusṭāṭ. This does not rule out the possibility that he was the brother of the author; in any event, it is clear from both the script and the bookcraft of MS Frankfurt that its copyist was of Byzantine origin.

[126] MS Jerusalem Yah. Ms. Heb. 1 is the earliest Sefardic manuscript on Spanish paper produced according to the Occidental technique (with single, regular, and uniform chain lines). This manuscript, in which only external bifolia are of parchment, aptly illustrates the vulnerability of paper as against the durability of parchment: of its first three quires only the external parchment bifolia remain while the paper bifolia perished. See *Manuscrits médiévaux*, I, 2. The second earliest manuscript – MS New York R 15, copied in Ubeda in 1290 – also contains quires in which only the external bifolia are made of parchment.

[127] MS Paris Hébreu 976. The manuscript was not included in *Manuscrits médiévaux*, which includes all of the dated manuscripts in libraries in France (and Israel), due to doubts regarding the validity of the date of the copying. These were dismissed once it became clear that the other manuscript, MS Parma mentioned in the next note, was copied by the same scribe.

[128] MS Parma Parm. 2395 (De-Rossi Catalogue 728); for the identification of the copyist see the Richler & Beit-Arié Catalogue (Parma).

[129] In the colophon of MS Paris he notes that he copied the manuscript while he was studying at R. Yo'av's *beit-midrash* (fol. 64v), and his purpose in coming to Rome may have been to study there.

[130] MS Munich Cod. hebr. 111, copied in 1330, and MS Vatican Neof. 29, copied in Tivoli in 1331 (containing two mixed quires only). Part of this manuscript was inscribed by two other copyists. See Richler & Beit-Arié Catalogue (Vatican), pp. 549-551.

[131] MS St. Petersburg Евр. I 479. A localised mixed-quire manuscript dated 1335-1336: MS Leiden, University Or. 4760 – Warn. 22 copied in Edrine. The scribe allowed three junior scribes (perhaps his sons?) to copy some short passages.

Data on the use of mixed quires, collected by Bianchi and others from a partial survey of Latin and Greek and a few Arabic manuscripts[132] diverge from the data collected from the Hebrew manuscripts. According to this partial survey, it seems that the technique of mixed quiring was used by Hebrew copyists to a much greater extent than it was by their Latin and Greek, and apparently also Arabic, counterparts. The geographical distribution of the mixed quiring is different too, as most of such Latin manuscripts were produced in the very zones where this technique was not practiced in Hebrew manuscripts – France, Germany, and England. Moreover, the overall data indicate that the use of mixed quiring in Hebrew bookcraft preceded its use in non-Hebrew manuscripts in Italy and Byzantium but not in Spain. Dated Latin manuscripts with mixed quires are found only in the late thirteenth century, and the dates in Greek Byzantine manuscripts of this type are later than the ones witnessed in Hebrew codices from that zone.[133] This said, Arabic production in Spain preceded the Hebrew ones in using this technique, the earliest mixed-quire Arabic manuscript dating from 1143.[134] The mixing of paper and parchment was practiced in Spain by Latin scribes as well.[135] It therefore stands to reason that mixed quiring originated in Spain whence it spread to other zones.

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[132] Above, n. 121.

[133] See Irigoin, 'Centres de copie byzantins' (1958) p. 221 (the earliest example is from 1276-1277); J. Irigoin, 'Typologie et description codicologique des manuscrits de papier', in *Paleografia e codicologia greca – Atti del II Colloquio internazionale (Berlino–Wolfenbüttel, 17–21 ottobre 1983)*, ed. D. Halfinger & G. Prato, Alessandria 1991, vol. 1, pp. 289–291 (the earliest example is from 1251).

[134] Van Koningsveld, *Glossary* (above, n. 12) p. 24. Van Koningsveld suggested that the technique evolved from the earlier practice of Arab scribes to copy a short work (or part of a work) in a single, independent multi-bifolium quire called جزو (ğuz'). This term and its derivatives – ,גיזו, גיזוין, אגיזא ,גיזז in the sense of a volume or a part occurs frequently in Hebrew book-lists in Judaeo-Arabic from the 12th and 13th centuries from the Cairo Geniza (See Allony, *Jewish Library*, e.g. in list no. 27, frequently on p. 100, and many more occurrences). Since medieval sources note that in North Africa these kinds of independent quires were wrapped in parchment, van Koningsveld assumed that they would have been assembled into one volume and, in the wake of this early practice, scribes in Spain eventually began to use mixed quires for producing continuous texts in the codex form. For several explanations of the ğuz' form, especially its role in disseminating texts, see G. Humbert, 'Copie "à la pecia" à Bagdad au IXe siècle?', *Gazette du livre médiéval*, 12 (1988), pp. 12–15; idem, 'Le ğuz' dans les manuscrits arabes médiévaux', in *Scribes et manuscrits du Moyen-Orient*, ed. F. Déroche & F. Richards, Paris 1997, pp. 78–86.

[135] In Latin paper codices produced in Spain this technique appears for the first time already in the earliest manuscript, MS Paris Nouvelles acquisitions lat. 1296. See Briquet, *Opuscula*, p. 47; van Koningsfeld, *Glossary* (above, n. 12), pp. 68-70, n. 89.

In Spain and Italy the technique of enfolding paper quires with parchment bifolia was sometimes implemented sparingly. Instead of protecting the back of the quires and their central openings with parchment bifolia, they were reinforced by thin strips of parchment which were pasted along the quire's backside and its centre, and sewn together with the quire's bifolia. This greatly reduced the cost of production without impairing the main purpose of mixed quiring, namely to protect the inner and outer bifolia from being damaged by the quire's tight or loose stitching.[136] It appears that most vulnerable was the inner fold of the central bifolium, judging from the fact that in the Hebrew manuscripts which used this reduced technique the reinforcing of the inner fold was prior to the reinforcing of both folds. In some cases parchment strips would be pasted only to the back of the folded quire. In fact, this phenomenon has been documented in a small number of manuscripts only and may have escaped our observation, especially at the early stages of the documentation. One should also remember that over the years parchment strips were lost as manuscripts were pulled apart for re-binding. The geo-cultural distribution of the practice of reinforcing quires with parchment only runs parallel to that of their reinforcement with entire parchment bifolia – Spain, Byzantium, and Italy. The first findings of reinforcing strips were in Sefardic manuscripts.[137] In Byzantium they were first found in dated manuscripts from the end of the 1360s and from the 1370s, and in Italy from around the same time. The existence of several manuscripts with reinforcing parchment strips in paper quires in Ashkenaz, where, as mentioned, mixed quires were not practiced, proves that this technique was not an evolution of an economising version of mixed quiring. This can

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[136] This technique was used already by early Latin scribes in the making of papyrus codices. See Bischoff, *Latin Palaeography*, p. 8, n. 8. Its purpose was to protect the stitching of the quires. For the use of this practice in Greek Byzantine manuscripts, see Irigoin, 'Premiers manuscrits grecs', pp. 221-222, n. 7. A similar method occurs in the Coptic Gnostic codices discovered in Nag Hammadi in Egypt, made of multi-bifolium papyrus quires. Two pieces of parchment were found, one along each seam, in the quire opening, to protect from the sewing threads. In codex VIII one single long piece, 9 centimetres wide, was used to reinforce the back of the quire. See J.A. Robinson, 'The Construction of the Nag Hammadi Codices', in *Essays in the Nag Hammadi Texts in Honour of Pahor Labib*, ed. M. Krause (Nag Hammadi Studies 6) Leiden 1975, p. 181; F. Wisse, 'Nag Hammadi Codex III – Codicological Introduction', *ibid.*, p. 231.

[137] The earliest was a non-localised manuscript dated 1282 (MS London Add. 27113, Margoliouth Catalogue 926); followed it a localised manuscript from Spain (Ubeda), which was the second manuscript from Spain with external parchment bifolia (see above, end of n. 126), while some of its quires were reinforced in the cost saving method.

also be clearly concluded from the technique of parchment strips employed in Latin manuscripts from France.[138]

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[138] Carla Bozzolo and Enzio Ornato found reinforcement strips in 20% of the many manuscripts they examined. See Bozzolo & Ornato, *Codicologie quantitative,* p. 133. See also Muzerelle, *Vocabulaire codicologique*; Lemaire, *Codicologie*, p. 43.

Tables 14-16: Distribution of supports until 1500

For the basis for the statistical calculations in the tables below, see above in the introduction, the section on 'General statistics of the database' (at the top of table 5).

Notations in tables 14-16 are as follows:

(1) parchment   (2) paper (3) mixed: parchment and paper (outer parchment bifolio or outer and central parchment bifolia)

  # number of manuscripts   % percentage

Table 14: Geo-cultural distribution of supports in manuscripts before 1500

Geocultural zone	1		2		3		Total in corpus
	#	%	#	%	#	%	
Sefarad	196	36	292	54	55	10	**544**
Ashkenaz	270	82	55	17	1	0	**330**
Italy	473	59	257	32	57	7	**798**
Byzantium	30	14	135	63	48	25	**215**
Orient	28	8	323	92	2	1	**353**
Yemen	14	13	92	87	0	0	**106**
Unidentified	7	33	12	58	3	13	**23**
Total	**1018**	**43**	**1166**	**49**	**166**	**7**	**2369**

Table 15: Chronological distribution of supports

Period	1		2		3		Total in corpus
	%	#	%	#	%	#	
0-900	1	100	0	0	0	0	1
901-1000	11	100	0	0	0	0	11
1001-1100	10	25	30	75	0	0	40
1101-1200	18	27	49	73	0	0	67
1201-1300	172	71	66	27	5	2	243
1301-1400	324	54	221	37	53	9	600
1401-1500	482	34	800	57	108	8	1407
Total	**1018**	**43**	**1166**	**49**	**166**	**7**	**2369**

Table 16: Geo-chronological distribution of supports

Zone	Period	1 #	1 %	2 #	2 %	3 #	3 %	Total in corpus
Sefarad	1001-1100	2	100	0	0	0	0	**2**
	1101-1200	4	67	2	33	0	0	**6**
	1201-1300	48	84	5	9	4	7	**57**
	1301-1400	70	46	56	37	26	17	**152**
	1401-1500	72	22	229	70	25	8	**327**
Ashkenaz	1101-1200	4	100	0	0	0	0	**4**
	1201-1300	68	100	0	0	0	0	**68**
	1301-1400	122	98	3	2	0	0	**125**
	1401-1500	76	57	52	39	1	1	**133**
Italy	1001-1100	2	100	0	0	0	0	**2**
	1101-1200	2	100	0	0	0	0	**2**
	1201-1300	46	98	1	2	0	0	**47**
	1301-1400	114	82	13	9	11	9	**139**
	1401-1500	309	51	243	40	46	8	**608**
Byzantium	1101-1200	2	100	0	0	0	0	**2**
	1201-1300	2	40	3	60	0	0	**5**
	1301-1400	12	21	30	52	15	26	**58**
	1401-1500	14	9	102	68	33	22	**150**
Orient	894/5?	1	100	0	0	0	0	**1**
	901-1000	11	100	0	0	0	0	**11**
	1001-1100	6	17	30	83	0	0	**36**
	1101-1200	4	8	46	92	0	0	**50**
	1201-1300	5	8	56	90	1	2	**62**
	1301-1400	1	1	88	99	0	0	**89**
	1401-1500	0	0	103	99	1	1	**104**
Yemen	1101-1200	0	0	1	100	0	0	**1**
	1201-1300	3	75	1	25	0	0	**4**
	1301-1400	3	9	30	91	0	0	**33**
	1401-1500	8	12	60	88	0	0	**68**
Unidentified	1101-1200	2	100	0	0	0	0	**2**
	1301-1400	2	50	1	25	1	25	**4**
	1401-1500	3	18	11	65	2	12	**17**
Total		**1018**	**43**	**1166**	**49**	**166**	**7**	**2369**

Sizes, page layout and formats

No doubt the discussion about codex sizes and of page and text layout[139] deserves a chapter of its own. Observations concerning page dimensions and their numeric ratios vis-à-vis the paper or parchment sheets belong both here and in the next chapter on quiring, while those concerning the dimensions of the written space and their internal ratios or the ratios of those dimensions vis-à-vis page dimensions, as well as the layout of the text in columns belong, in fact, in the chapter on ruling. However, since these two aspects, dictated by the dimensions of the parchment or paper sheets, depend on each other I saw it fit to present them here briefly. Briefly, because to this day this topic has not been studied thoroughly enough in Hebrew manuscripts.[140] Indeed, data on page dimensions, written space dimensions and dimensions of the four surrounding margins in the corpus of dated manuscripts (and in manuscripts containing the scribe's name) have been collected and are included in the SfarData database. Moreover, the database presents calculations of the ratios of these components to each other in each manuscript, including those which are crucial for a regional and chronological characterisation of bookcraft and book design, and possibly for the characterisation of the textual genre,

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[139] Mise en page: the folio design (its size and the ratio of width to height), and the disposition of the text (its layout on the writing material, or actually on the symmetrical page opening). For an exhaustive review, found in Latin and Greek manuscripts, of the recipes and guidelines for determining the ruling proportions, their analysis and an examination of their application in manuscripts, as well as detailed references to studies that discuss the layouts of manuscripts (including Arabic manuscripts), see M. Maniaci, 'Ricette e canoni di impaginazione del libro medievale – Nuove osservazioni e verifiche', *Scrineum Rivista*, 10 (2013), pp. 1–48 [www.fupress.com/scrineum].

[140] In the meantime one may refer to my attempt to rely on the dimensions of early Oriental Bibles made of parchment and their width to height ratios for dating the Pentateuch known as כתר דמשק in my introduction to its facsimile edition: M. Beit-Arié, 'Codicological and Palaeographical Description' in *The Damascus Pentateuch – Manuscript From About the Year 1000 Containing Almost the Whole Pentateuch*, vol. 2, ed. M. Beit-Arié (Early Hebrew Manuscripts in Facsimile 2), Copenhagen 1982, p. 8 [= Beit-Arié, *Makings*, pp. 116-117]. For the calculation of the dimensions of the sheets of Oriental paper and the reconstruction of their folding (based on the direction of the chain lines in the folios) in early Hebrew manuscripts from the 11th and 12th century, see my introductions to *Codices hebraicis*, Parts I-IV (in Part I, the section on 'Size and Layout; in Parts II-IV the section on 'Writing Materials and Formats').

namely – the ratio width to height of the page,[141] the ratio width to height of the written space[142] and the ratio of the written space to the total area of the page. It goes without saying that manuscripts inscribed on parchment must be distinguished from those inscribed on paper (or on mixed parchment and paper quires) which dimensions are dictated by the size of the parchment or paper sheets, while their width to height ratios – especially those of the written area – are likely to be similar. Certainly, page dimensions have a typological and chronological value, as have the dimensions of the written space and the ratio of page dimensions to written space dimensions, which are easily measured and calculated. This said, one should keep in mind that the outer margins of manuscripts would have been cropped and sometimes greatly reduced in the process of repeated rebinding, while only the inner margins remained intact. The height dimension of books suffered more than their width, since the height would be trimmed at both upper and lower margins, whereas the width - only on the outer margins; consequently the ratios of page dimensions would be marred either slightly or considerably. One should also consider the change in page dimensions due to of the shrinking of the parchment over time (this is clearly visible in mixed quires of parchment and paper).[143] For the above reasons, the width to height ratio of the written space is the more reliable measurement.

The examination of the folios' shapes, dimensions, and proportions and of the text layout may well provide a codicological criterion and help in locating the manuscript's provenance and in estimating its date. Several examples, all deriving from parchment manuscripts, can be shown already at this stage of research. For instance, in the oversize biblical codices that characterized the Middle East during the first century of the spread of the Tiberian version (the tenth century), the folios' width to height ratio is 0.82-0.92,[144] and the width to height ratio of the written space is 0.46-0.58. In the many oversize Ashkenazic codices, especially Bibles, maḥzors, and halakhic treatises produced in Germany and to a lesser extent in France from late-twelfth century till mid-

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[141] For the ratios and formats in Latin manuscripts, see J.P. Gumbert, 'The Sizes of Manuscripts – Some Statistics and Notes', in *Hellinga Festschrift – Forty-Three studies in Bibliography Presented to Prof. Dr. Wytze Hellinga*, ed. A.R.A. Croiset van Uchelen, Amsterdam 1980, pp. 277–288, and idem, 'Sizes and Formats' in Maniaci & Munafò (eds.), *Book Materials and Techniques*, vol. 1, pp. 227-263.

[142] Gumbert did not examine the ratios of the written space dimensions.

[143] See Glatzer, 'Aleppo', pp. 188-190.

[144] Some of these differences in dimension may perhaps be attributed to the degree of trimming of the upper and lower margins during rebindings.

fourteenth century,[145] their width to height and the width to height ratios of their written space are different from those in the early Oriental codices: in dozens of Ashkenazic manuscripts which height is 400 millimetres or more the width to height ratio of the folios is 0.63-0.79, and the width to height ratio of the written space is usually similar: 0.62-0.74 (a design that perhaps corresponds to the vertical orientation of the Gothic style).[146] The typical dimensions of parchment manuscripts from Spain and Provence are similar to those found in the Orient, and they tend toward a square format. Small-dimensioned codices with an oblong format (i.e. whose width is greater than their height) among early Geniza fragments[147] and North African codices[148] are similar to those of earlier or contemporaneous Arabic manuscripts.[149] One may similarly note the

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[145] The Erfurt Bible was copied in Germany in 1343, and its dimensions are apparently the largest among all Hebrew manuscripts (629×470 millimetres). On this codex, see below, chapter 4, n. 8.

[146] According to Gumbert, in his article 'Sizes and Formats' (above, n. 141), 0.7 was the preferred ratio in Latin manuscripts from the late early period until the end of the Middle Ages.

[147] For example, in the Geniza fragments of a biblical text copied in Iran in 903/4, which is the earliest manuscript whose date is not in doubt (see *Manuscrits médiévaux*, Part I, 2). In this manuscript the ratio in folio dimensions is equal to that in written space dimensions – 1.08. For biblical manuscripts of small dimensions from the early 11th and early 12th century, which contained only one portion (*parasha*) of the Pentateuch (similar to Kufic Qur'ans which contained single suras), which dimensions, layout, and decoration demonstrate that they were produced in Iran, see *Codices hebraicis*, Part III, Manuscrit 50. Cf. Sirat, *Hebrew Manuscripts*, pp. 117-119, and the description of the only Hebrew surviving papyrus codex (measuring 215 millimetres high and 230 millimetres wide).

[148] E.g. MS St. Petersburg Евр. II B 338 from 1276/7 (the ratio of folio dimensions is equal to that of the written space dimensions – 1.14).

[149] The extended pen strokes of the early Kufic script seem to have dictated the reversal of the ratio between height and width in most of the early Qur'ans produced in the 9th and 10th centuries. See M. Lings & Y. H. Safadi, *The Qur'an – Catalogue of an Exhibition of Qur'an Manuscripts at the British Library, 3 April–15 August 1976*, London 1976, p. 17; Déroche, *Manuscrits du Coran*, p. 19. Déroche noticed that the width of the written space in most of the Kufic fragments in his catalogue exceeds its height by 70 millimetres (the height being 50 millimetres in small formats). See ibid., the instructive table of the dimensions of the written space of all the manuscripts shown in plate XXIV. Déroche proposed that the transition from the vertical format to the horizontal (oblong) format occurred in the early 8th century. See F. Déroche, 'Inks and Page Setting in Early Qur'ānic Manuscripts – A Few Unusual Cases', in *From Codicology to Technology: Islamic Manuscripts and their Place in Scholarship*, ed. S. Brinkmann & B. Weismüller, Berlin 2009, p. 86, and cf. ibid., the plates of early Qur'an fragments from the Damascus Geniza. The dimensions of the Hebrew biblical codices that were produced in the Middle East were of course much larger and their height always exceeded, at least slightly, their width, as in the vertical form of the Qu'rans in the early Ḥijazi script which is associated with the 7th and 8th centuries (see Déroche, *Manuscrits du Coran*, pp. 19, 50). The wide format of Qur'ans in the Kufic script was abandoned in the 11th century (see M. Lings, *The Qur'anic Art of Calligraphy and Illumination*, England 1976, p. 18). The dimensions, layout and decoration of the small size manuscripts that contain a single portion of the Pentateuch, like the Kufic Qur'ans that contained single suras and were produced in Iran in the 11th and 12th centuries, attest to the powerful influence that Arabic calligraphy had on the design of Hebrew manuscripts. Cf. *Manuscrits médiévaux*, Part II, 2. Despite the great similarity to Kufic Qur'ans the dimensions of the Hebrew manuscripts, as well as their script, are not dilated. The Kufic

typical dimensions of Italian manuscripts and their transformations over the centuries, and their correlation to the genre of the text, by comparing them with the dimensions of Latin codices. This type of quantitative classification of the dated manuscripts from Italy shows that in most codices that do not hold large scale texts Italian copyists and owners preferred to produce manuscripts of relatively small dimensions.

In recent years Latin codicology tends to present the dimensions of manuscripts by means of a formula[150] that expresses the height and width dimensions as a single value, enabling a more efficient process of classifying manuscripts.[151] This has led to the introduction of the term *taille* – size – a term combining the dimensions of height and width. The SfarData database calculates the *taille* in the specifications for dimensions and ratios, but these data have not been used for typological purposes.

The term 'format',[152] often mistakenly used to refer to dimensions, presents the reconstruction of the dimensions of the raw sheets of parchment or paper and their

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Qur'ans were always inscribed in one column, whereas the Oriental Hebrew codices were usually laid out in three narrow columns, recalling the columns in a Tora scroll when rolled out for reading; at times two columns would be laid out (depending on the region of production) like in Syriac or Greek biblical manuscripts. Unusual among the early Greek Bibles are two 4th-century manuscripts: the oversize Codex Sinaiticus, which resembles Hebrew biblical codices and has four columns, and Codex Vaticanus, inscribed in three columns. See E.G. Turner, *The Typology of the Early Codex*, [Philadelphia] 1977, cf. Table 16 on p. 134 and Plates 25-26 in *Mise en page et mise en texte du livre manuscrit*, ed. H.-J. Martinet & J. Vezin, [Paris] 1990, pp. 62–65. It is interesting that in the four columned Codex Sinaiticus, the books of Job, Proverbs, and Psalms were inscribed in two columns, as in later Hebrew biblical codices. This may perhaps indicate an influence of the Jewish custom and validate Milne and Skeat's conclusion that Codex Sinaiticus had been produced in Caesarea. See P. Mayerson, 'Codex Sinaiticus – An Historical Observation', *Biblical Archaeologist*, 46 (Winter 1983), pp. 54–56. Yet, it should be noted that there are no extant Hebrew biblical manuscripts from the time of Codex Siniticus until the tenth century. Psalms among the Dead Sea scrolls are written in one continuous column with small space between verses.

[150] See D. Muzerelle, 'Normes et recettes de mise en page dans le codex pré-carolingien', in Les débuts du codex – Actes de la journée d'étude organisée à Paris le 3 et 4 juilliet 1985 par l'Institut de papyrologie de la Sorbonne et l'Institut de recherche et de l'histoire des textes, ed. A. Blanchard (Bibliologia 9), Turnhout 1989, pp. 125–156.

[151] See recently D. Muzerelle, 'Pour revenir sur et à la "taille" des manuscrits', *Gazette du livre médiéval*, 50 (2007), pp. 55–6. But cf. Gumbert's proposal (J.P. Gumbert, 'Livre grand, livre petit: Un problème de taille', *Gazette du livre médiéval*, 38 [2001], pp. 55–58) to rely only on one dimension – the height of the manuscript – in classifying manuscripts sizes, given its simplicity and transparency and since the dimension ratios of Latin manuscripts do not differ much, and ibid, Muzerelle's response.

[152] See both of Gumbert's above-cited articles (n. 141), and his article 'Skins, Sheets and Quires' (below, chapter 4, n. 9, which includes references to additional literature dealing with the forming of quires by folding the sheets of parchment); see also a concise and exhaustive explanation of the terms in Gumbert, *Words for Codices*, paragraphs 312.0, 312.1.

folding in view of preparing bifolia for quiring.[153] Formats have hardly been investigated in Hebrew codicology.[154] In the next chapter I shall comment on the lack of evidence in Hebrew codices of quiring by folding parchment sheets. One should stress that the width to height ratio in bifolia is preserved in each folding of the parchment or paper sheet.

Ways of folding sheets of Occidental 'Chancery' type paper

From: Gumbert, *Words for Codices*, Part 3 (2009), p. 31

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[153] Gumbert (*Words for Codices*, paragraph 312.1) distinguishes between 'material format' (the ratio of folio to sheet) and 'working format' (reconstruction of the way in which bifolia were produced to achieve this ratio).

[154] With the exception of the paper moulds in Oriental manuscripts mentioned above in n. 140. Lists of books that were copied and offered for sale by Yosef Rosh HaSeder in Egypt at the end of the 12th and the beginning of the 13th century can shed light on the issue of manuscripts' formats. In many of his entries, Yosef Rosh HaSeder, who used Baghdadi paper for copying, noted the manuscript's format – quarto or octavo (i.e. folios formed by folding the sheet of paper either twice or thrice), see Allony, Jewish Library, nos. 97, 99, 101, 112.

Common and some less common foldings (dimensions as from Chancery paper)

⟹ = *folds* in which the long side is halved (*short folds*)

→ = *folds* in which the short side is halved (*long folds*)

sheet (42 × 30)

tall 2° (42 × 15)   2° (30 × 21)

tall 4° (30 × 10)   oblong 4° (15 × 21)   4° (21 × 15)

tall 8° (21 × 7) [types C, D according to Gilissen]   [A, B]   oblong 8° (10 × 15)   8° (15 × 10) [types A, B]   [C, D]
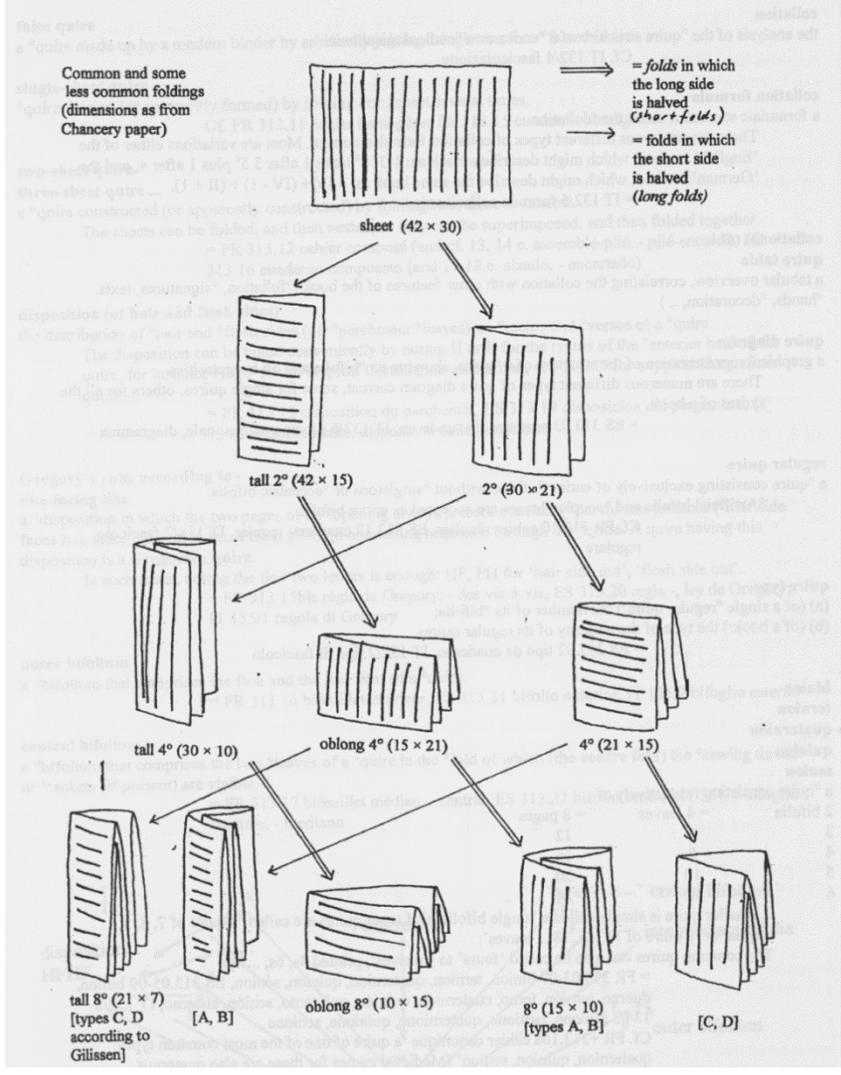
Formats and dimensions of Bolognese paper sheets and their folding into bifolia

From: J.P. Gumbert, 'More "Dated Manuscripts"', *Quaerendo*, 38 (2008), p 87

'Official' Bolognese paper sizes

	sheet	folio	quarto	octavo
Imperial	73 × 50	50 × 36	36 × 25	25 × 18
Royal	61 × 44	44 × 30	30 × 22	22 × 15
Median	49 × 35	35 × 24	24 × 17	17 × 12
'Chancery'	44 × 31	31 × 22	22 × 15	15 × 11

One can easily discern the format and number of foldings in manuscripts inscribed on Occidental paper according to the direction of the chain lines and embedded watermarks, as shown below (the figures are taken from D. Muzerelle, *Vocabulaire codicologique: Repertoire méthodique des termes français relatifs aux manuscrits*, Paris 1985, Figs. 40, 42, 45):
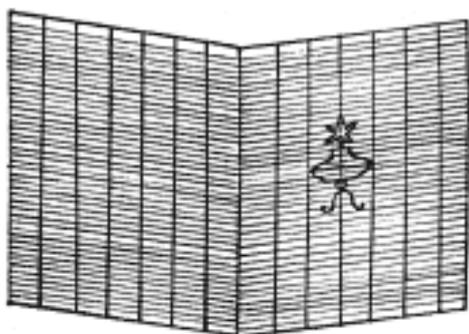
In folio-format manuscripts, which bifolia match a paper sheet folded once, the chain lines will appear parallel to the length of the folio and the water mark will show fully in one half of every bifolium; namely – in half of the quire's folios.
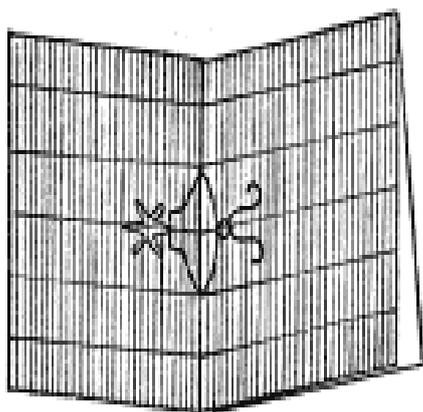
In quarto-format manuscripts, which folios are created by folding the sheet twice, chain lines will appear perpendicular to the length of the folios and the bisected watermark will show in the centre of the bifolium opening on both sides of its fold; thus the halved watermarks will appear in half of the quire's folios.
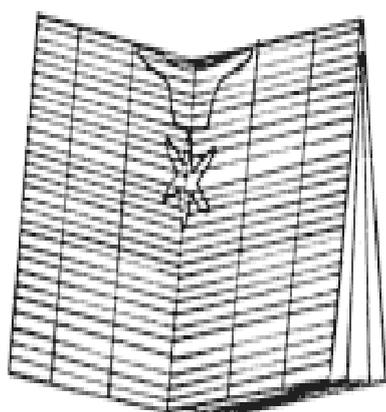
In octavo-format manuscripts, where folios were created by folding the paper sheet thrice, the chain lines will appear parallel to the folio's length, and quartered watermarks will appear on the upper margins of the folios to be trimmed during the binding; thus they will appear in half of the quire's folios.

One should keep in mind that copyists, like printers, could also compose quires by folding and cutting half-sheets and even quarter-sheets of paper. Constructing quires by systematically folding sheets is, of course, appropriate for printing, but not for

manuscripts; certainly not for the considerable number of Hebrew manuscripts in which quiring practices were based on odd numbers. Undoubtedly, the copyist would fold the sheets, cut them, stack the bifolia in no particular order, and later retrieve a few bifolium from the stack according to his needs and local custom. Moreover, the distribution of watermarks in Hebrew manuscripts shows that paper sheets with different watermarks were used within the same quire.

4. Ink

A comprehensive typology devoted to bookcraft should obviously include information, albeit minimal, about inks used in medieval Hebrew manuscripts. Since the topic of ink is introduced here in the utmost briefness, it is not treated in a chapter unto itself, and the short discussion here is therefore appended to the chapter on writing materials.

A bronze kit for carrying scribal tools deriving from the Ummayid period discovered in Ein-Gedi in 2003: a long tube case for the quill and, affixed to it, a lidded inkwell containing remains of a mixture used for producing black ink. Inside the tube a short chain and bronze staff were found. The chain attached to the inkwell lid was apparently used for fastening the equipment to the scribe's belt. Near the bronze case a small glass phial was found. See a detailed description and a discussion of ink in antiquity and of similar tools found in Palestine and Egypt in R. Porat, H. Eshel & A. Frumkin, 'A. Bronze Scribe's Case from En Gedi', *IMSA*, 6 (2007), pp. 3–12.

Generally, one distinguished between charcoal ink, of which the chief ingredient is charcoal, and iron-gall ink, which chief ingredient is iron sulfate. Charcoal ink was used in ancient Egypt, in the Hellenistic world, and in Rome,[155] and - as shown by chemical analysis - in the Dead Sea Scrolls.[156] It seems that during the second century iron-gall

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[155] For a brief summary about the composition of ink in antiquity in the Middle East and in the Classical world, see M. Haran, 'Book-Scrolls in Israel in Pre-Exilic Times' (above, n. 6), pp. 75-80. A y Monique Zerdoun Bat Yehouda's study of black inks is devoted to the various compositions of charcoal ink in the cultural traditions of the Far East and the Middle East, according to literary sources and recipes in Jewish halakhic literature and Muslim legal literature. See M. Zerdoun Bat-Yehouda, *Les encres noires au Moyen Âge jusqu'à 1600*, Paris 1983 (repr. 2003).

[156] See Y. Nir-El & M. Broshi, 'The Black Ink of the Qumran Scrolls', *Dead Sea Discoveries*, 3.2 (1996), pp. 157–167.

ink began to be produced, based on iron and tannin derived from gallnuts – namely, growths appearing on plants (such as oak or the pistacia tree) and brought about by the parasitic activity of insects and larvae. Evidence for the use of iron-gall ink for inscribing Tora scrolls, *tefillin*, and *mezuzas* appears already at the time of the fourth generation of *Tana'im* in a Babylonian Talmud *baraita*:

דתני׳ דאמ׳ ר׳ מאיר כשהייתי אצל ר׳ ישמעאל היתי מטיל קנקנתום לתוך הדיו ולא אמר לי דבר וכשבאתי לפני ר׳ עקיבא אסרה עלי. איני? והאמ׳ רב יהודה אמ׳ שמואל משום ר׳ מאיר כשהיתי לומד תורה אצל ר׳ עקיבא היתי מטיל קנקנתום לתוך הדיו ולא אמר לי דבר וכשבאתי לפני ר׳ ישמעאל (אסרה עלי) בא ואמ׳ לי בני מה מלאכתך אמרתי לו לבלר אני אמ׳ לי בני הוי זהיר במלאכתך שמלאכת שמים היא שאם אתה מחסר אות אחת או מייתר נמצא אתה מחריב כל העולם כולו אמרתי לו ר׳ דבר אחד יש לי וקנקנתום שמו שאני מטיל לתוך הדיו ואמ׳ לי ו׳ כי מטילין קנקנתום לתוך הדיו והלא אמרה תורה ומחה ‹במד׳ ה:כג› ‹נוסף בהגהה : כתב› שיכול לימחות ‹...› תניא ר׳ יהודה או׳ ר׳ מאיר היה או׳ לכל מטילין קנקנתום לתוך הדיו חוץ מפרש׳ סוטה ר׳ יעקב אומ׳ משמו חוץ מפרש׳ סוטה שבמקדש.
(B. Eruvin 13a and a parallel in B. Sota 20a)[157]

It seems that ink manufacture in the Orient continued to be based on charcoal, which lent the ink in most of the extant Oriental manuscripts its black (or grey) hue, whereas the colours of iron-gall ink in manuscripts copied in Europe, which initially was also black (because of the mixture of tannin), gradually faded over the years turning into shades of brown, with the iron ink sometimes consuming the writing material. However, recent studies demonstrate that iron ink would also be used in Oriental manuscripts (see below). Documentary sources from the Geniza concerning ink have

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[157] According to the library's website scan of MS Munich Cod, hebr. 95. The term for iron sulfate – a loanword from the Greek ἀχλχανθος appears in this *baraita* and in other locations in the Talmud and Tosefta with variant spellings – קלקנתוס, קנקתוס, קנקנתום (according to the database of text witnesses of the Babylonian Talmud at The Saul Lieberman Institute of Talmudic Research [The Sol and Evelyn Henkind Talmud Text Database] and in manuscripts of the Tosefta, see Lieberman's edition of T. Shabbat 11:18, in S. Lieberman *Tosefta according to Codex Vienna, Seder Moʻed*, vol. 2, New York 1961/2, p. 50 (in Hebrew). See the references to discussions of this term in S. Lieberman, *Tosefta ki-fshuta, a comprehensive commentary on the Tosefta*, vol. 3: Seder Moʻed : Shabbat, New York 1961/2, p. 182 (in Hebrew). In his Code (*Mishne Tora*, Sefer Ahava, Hilkhot Tefillin, Mezuza and Sefer Torah, 1:4) Maimonides describes the process of producing charcoal ink for ritua writing of *tefillin*, m*ezuzas* and Tora scrolls, although he does not rule out the use of iron-gall ink: כיצד מעשה הדיו מקבצין העשן שלשמנים או שלזפת ושעוה וכיוצא בו וגובלין אותו בשרף האילן ובמעט דבש ולותתין אותו הרבה ודכין אותו ובשעת כתיבה שורהו במי עפצא וכיוצא בו וכותב בו שאם תמחקנו ימחק וזה הדיו שמצוה מן המובחר לכתוב בו ספרים תפלין ומזוזת ואם כתב שלשתן במי עפצא וקלקנתוס שהוא עומד ואינו נמחק כשרים (According to MS Oxford MS. Hunt. 80, which proofreading as against his own manuscript Maimonides confirmed by his signature). Indeed, medieval ink was produced as a dry substance that was diluted with liquid for the purpose of writing.

been collated by Goitein,[158] indicating that usually the ink was not produced by the scribe but purchased from a one who specialized in ink-making.

Recently, non-invasive optical and chemical tests of the ink in medieval manuscripts have been performed, some based on spectrographic analysis and some on X-ray fluorescence. Thses may provide precise information about the compositions of inks in various regions and periods and, moreover, reveal changes in the ink of the same codex and its various layers.[159] Lately, some inexpensive, portable and user-friendly spectrographic instruments have been developed, allowing tests to be performed rapidly. A recent publication surveys these various testing techniques, their respective advantages, and the results they are capable of furnishing.[160]

One such portable optical instrument, the Dino-Lite AD413-12V, a USB multispectral electronic microscope that produces light waves of varying wavelengths, ranging from a short ultra-violet to a long infra-red wavelength, allows to distinguish easily between charcoal ink, which colour is visible under infra-red lighting, from iron-gall ink, which fades or becomes completely invisible under the same lighting.

In 2014, at the initiative of chemist Ira Rabin and with her assistance, I selected a small sample of manuscripts (mostly Hebrew ones) from the collection of the National Library of Israel, to be examined with the abovementioned tool. All the European

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[158] Goitein, *Mediterranean Society*, vol. 2, pp. 233-234.

[159] See the related articles issue in the collection Maniaci & Munafò (eds.), *Book Materials and Techniques*; as well as: Canart et al., 'Réglure en couleur'; O. Hahn, B. Kanngießer & W. Malzer, 'X-Ray Fluorescence Analysis of Iron Gall Inks, Pencils, and Coloured Pencils', *Studies in Conservation*, 50/1 (2005), pp. 23–32; O. Hahn, T. Wolff, H.-O. Feistel, I. Rabin & M. Beit-Arié, 'The Erfurt Hebrew Giant Bible and the Experimental XRF Analysis of Ink and Plummet Composition', *Gazette du livre médiéval*, 51 (2008), pp. 16–29.

[160] I. Rabin, R. Schütz, A. Kohl, T. Wolff, R. Tagle, S. Pentzien, O. Hahn & S. Emmel, 'Identification and Classification of Historical Writing Inks in Spectroscopy – A Methodological Overview', *Comparative Oriental Manuscript Studies Newsletter*, 3 (January 2012), pp. 26–30. Z. Cohen, J. Olszowy-Schlanger, O, Hahn & I. Rabin, 'Composition Analysis of Writing Materials in Geniza Fragments', in *Jewish Manuscript Cultures: New Perspectives*, ed. I. Wandrey (Studies in Manuscript Cultures 13) 2017, pp. 323-337. Recently a good number of articles on ink analyses were published in a special issue of *Manuscript Cultures* dedicated to the contribution of sciences and technology to the analysis of manuscripts, among them an innovative research on mixed inks (charcoal ink with tannin or iron-gall ink), see C. Colini, O. Hahn, O. Bonnerot, S. Steger, Z. Cohen, T. Ghigo, M. Bicchieri, P. Biocca, M. Krutzsch & I. Rabin, 'The Quest for the Mixed Inks', ed. I. Wandrey, *Manuscript Cultures*, 11 (2018), pp. 41-48.

manuscripts examined in the sample revealed the use of iron-gall ink: MS Heb. 8° 4120, copied in Italy in 1282, shown in the figure below; MS Heb. 8° 1403/3, copied in Saragossa in Spain in 1341; MS Heb. 8° 6330 copied in Germany in 1366/7 and MS Heb. 4° 1114, copied there in 1419. The results of the testing of the Oriental manuscripts were surprising: they, too, were in most cases inscribed in iron-gall ink, a few perhaps with a mixture of soot, while a minority used charcoal ink: MS Yah. Ms. Ar. 966, a Qur'an copied in mid-ninth century (in 904/5 a vocalization, different from its original one, was added in it), was copied in iron-gall ink; MS Heb. 4° 4572, a Pentateuch known as 'The Damascus Keter', undoubtedly copied in Palestine in the tenth century, used iron-gall ink; MS Heb. 4° 5703/2, Maimonides' commentary on the Mishna's order of *Nashim*, was inscribed in his own hand in iron-gall ink; and MS Heb. 8° 6235, was copied in Aleppo in 1236 in iron-gall ink. In contrast, only two manuscripts from this limited sample were found to be written in charcoal ink: MS Heb. 8° 2238, a decorated Pentateuch portion (*Shelaḥ Lekha*, from the Book of Exodus), copied in Iran in 1106/7, and MS Yah. Ms. Heb. 6, copied in al-Tawila, Yemen, in 1359.

MS Jerusalem, NLI Heb. 8° 4120 <Italy> 1282, fol. 38v. Iron-gall ink

NIR (Near-Infra-red)
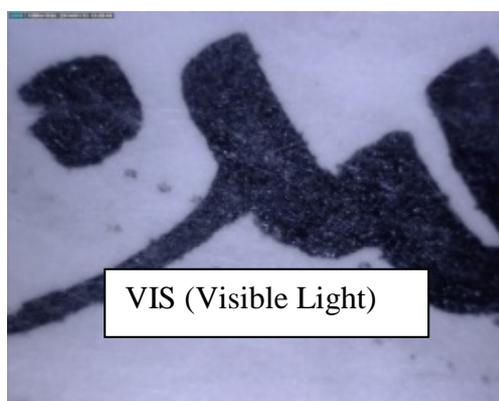
VIS (Visible Light)

MS Jerusalem, NLI Ms. Or. 838, early Jerusalem, early twentieth century. Charcoal ink

Inks of Hebrew manuscripts in Jerusalem, National Library of Israel

MS	Place, date	VIS	NIR	ink
Maimonides autograph Heb. 8° 6235	Cairo ca.1165			Iron gall
Heb. 8 6235	Aleppo 1236			
Yah. MS.Heb. 6	Al-Twila (Yemen) 1359			
Heb. 8° 2238	<Iran> 1106/7			
Yah. MS Ar. 966 (Kuran)	<mid 9th cen.> revocalised 904/5			
Heb. 4° 5703/2 (Bible)	Palestine <10th cen.>			
Heb. 8° 1403/3	Saragossa (Spain) 1341			
Heb. 8° 4210	<Italy> 1282			
Heb. 4° 6330	Germany 1366/7			
Heb. 4° 1114	Germany 1419			
Syriac handwriting by a scribe-monk, Jerusalem 1992				carbon

Inks of Hebrew manuscripts in Berlin, Staatsbibliothek zu Berlin (Preussischer Kulturbesitz)

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MS	Place, date	VIS	NIR	ink
MS. Or. Oct 256	Baghdad, 1341			carbon
MS. Or. Oct 351	<Egypt>, 1435			carbon
MS. Or. Fol 583	<Italy>, 1288			iron-gall
MS. Or. Fol 585	Falset (Spain), 1365			iron-gall
MS. Or. Qu 835	<Provence>, 1385			iron-gall
MS. Or. Qu 831	Viadana (Italy), 1460			iron-gall

Chapter 4: Quiring

The change in the mode of book production evident in the transition from the scroll to the codex form was a technological revolution with far-reaching cultural implications. The revolution lay in a shift from the practice of attaching consecutive units of writing material by gluing together papyrus sheets or stitching together parchment sheets with text inscribed on one side only and rolling them up into a scroll, to the practice of tying and binding together units of papyrus (only in the earlier period) or parchment and eventually paper, written on both sides, in a manner that held together and preserved the book without fear of its folios separating, allowing the reader to comfortably leaf through it. Achieving this drastic change in the book-form and ensuring that a codex be easily perused, opening by opening (the two pages as seen by the reader upon opening a book in the codex form), and at the same time securing its physical integrity, required that it be composed of quires[1] (Hebrew - קונטרס [*quntras/quntres*]; French - *cahier*; Italian - *fascicolo*; German - *lage*; English - quire [or gathering]). It is impossible to produce a multi-folio codex that would open easily for comfortable continuous reading or for navigating, without a backbone of quires.[2] The quire is the material production unit of the codex. The base component of the quire is the bifolium[3]:

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[1] On the etymology of the Hebrew term see in the appendix to this chapter in the Hebrew version of *Hebrew Codicology*. Mordechai Akiva Friedman drew my attention to sources from the Geonic literature in which, to his view, the Arabic דרג׳ (*daraj*) meant quire. I myself reckon that the term there is not codicological but rather bibliographical. That term was used for assembling several textual units in a quire form, not for a manuscript quire. It seems that in that specific case it referred to an ongoing compilation of responsa.

[2] This is valid for the production of printed books as well. Until around the mid-twentieth century, quires were stitched before their binding. However, when production of cheap paperback books began, the paper folds were cut and the separate folios were pasted backwards to the binding so as to reduce production costs by avoiding the stitching of the quires. As a result, quiring infrastructure became undetectable.

[3] One should distinguish between bifolium and sheet: a sheet is the unprocessed writing material in its original size, as manufactured before being cut into the bifolia from which quires are made. Only in folio-sized books (see below) do sheet- and bifolium sizes coincide. Gumbert (*Words for Codices*, p. 1) proposed that the English word sheet be adopted to describe the raw material, in accordance with the past and current use of the word. Nowadays, the codicological meaning of the Hebrew term used for bifolium - גיליון - differs from its meaning in medieval times and until recent times, when it referred to the margins of the manuscript or the printed book. Shemu'el ben Shemu'el, who completed the copying of a commentary on the legends of the Talmud in Provence circa 1423 (as may be assessed from other manuscripts he copied), inscribed it on 56 folios (i.e. 28 bifolia), as testified by him in his colophon: אני שמייאל בוניט קבלתי מיד יוסף כהן ט גסים בעד כתיבת כ״ח עלים שכתבתי בזה הספר (MS Munich Cod. hebr. 94). He evidently referred to the bifolia as 'leaves', a term that, after the end of the Middle Ages, usually

a rectangular piece of writing material folded in two, thus creating two folios (English - bifolium [pl. bifolia] [4]; French - *bifeuillet*, and until recently especially *diplôme*; Italian - *bifoglio* or *bifolio*; German - *bogen*).[5] Every quire is composed of several bifolia made of parchment or paper. The bifolia, which width exceeds their height, would be stacked one above the other and folded widthways in their middle, thus making two joint folios (namely four pages) of each bifolium. A folio is therefore not a distinct codicological unit and it would tend to go astray unless attached to another folio. A copyist that was constrained, for whatever reason (a serious scribal error, damage to the folio, etc.), to remove a folio, would cut it in such a way that a stub - strip of its inner margin - was left so that its paired folio remain stitched into the quire and does not get lost.[6] This said, from the tenth century onward quite a few quires were found to contain some bifolia made of two single folios assembled by aid of their stubs.[7] This phenomenon of

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denoted a folio (being a literal translation of the Latin term). The term עלים ('leaves') in the sense of bifolia appears also in a colophon dated 1529, inscribed in an Ashkenazic script affected by a Byzantine-Sefardic type script, presumably in Byzantium: טו קונטרסים הם, כל אחד מד׳ עלים (MS Cambridge Add. 505, 2-9). This same term, עלין, was also used by the grammarian and lexicographer Elia Levita (Baḥur) in his dictionary, *Sefer ha-Tishbi*, under the entry קוּנְטְרֵס: see the discussion in the appendix to this chapter in the Hebrew version, part b, in the text referenced there by note 32 and in the note. For the use of the word כף (palm) and its synonym יד (hand) to signify an empty quire or a written one, see B. Klar, 'Le-darkhei harḥavat ha-lashon ha-'ivrit bi-yemei ha-beinayim', *Lešonenu*, 16 (1946/7), pp. 121-122 (in Hebrew). The term was used by poets and scholars in Spain, beginning with Menaḥem Ibn Saruq in the letter of complaint he wrote to Ḥisdai Ibn Shaprut (in the 10th century). The clearest example Klar presents for a non-poetic use is taken from Rabbi Shelomo ben Avraham Adret's responsa, par. 548: לי ספר כ״ג ידות של נייר <...> ועוד התחיל לכתוב לו פירוש ארוך על כל תיבה ותיבה, ועל עלה אחד של נייר מן הספר פירש שתי ידות של נייר. Klar's proposal that the term was derived from the Arabic كَفّ requires further investigation.

[4] Meaning a double-leaf in Latin, as well as in Greek - διφυλλον. See J. Irigoin, 'La terminologie du livre et de l'écriture dans le monde byzantin', in *Vocabulaire du livre et de l'écriture au Moyen Âge – Actes de la table ronde, Paris, 24–26 September 1987*, ed. O.Weijers, Turnhout 1989, p. 17.

[5] See Muzerelle, *Vocabulaire codicologique*, par. 311.03.

[6] In many manuscripts one finds stubs (French: talôn, Italian: tallone) of folios that remained mostly unused: these would eventually be cut by owners who wished to employ them for writing letters or documents. See the prohibition of this practice in *Sefer Ḥasidim* (like many other prohibitions it includes concerning scribal practices): אם יראה אדם שני דפין <היינו שני דפי גיליון חבורים> אחד כתוב ואחד שאינו כתוב וצריך לדף שאינו כתוב, אל יחתוך אותו וכן אפילו דף אחד והוא צריך לגליונין <כלומר לשוליים>, ואם צריך לשלוח כתב ויש לו דף כתוב ויש לאותו דף גיליון <היינו בן זוג> חלק, אל יכתוב בגיליון צרכיו שצריך לשלוח לחבירו בין שכתוב בו תורה שבכתב בין שכתוב בו תורה שבעל פה, ולא ישלח הדף לחבירו אלא יגנוז או יכתוב בו דברי תורה (Section 600).

[7] In the Aleppo Codex, copied circa 930, most of the quires were constructed so that the third internal bifolium of the five-bifolia quires (quinions) was made by pairing of a singleton folio and its stub with another singleton and its stub. In some quires an additional bifolium would be set up in this manner. See Glatzer, 'Aleppo', pp. 232-235; *Codices hebraicis*, Part I, Manuscrit 6. The same phenomenon occurs in Qur'anic manuscripts inscribed in the Orient during the ninth century. See Déroche & Richard, 'Du parchemin au papier', pp. 188. Gumbert (*Words for Codices*, par. 314.2) proposes using the term 'coupled leaves' for a bifolium that was thus constructed and integrated into a quire.

pairing individual folios occurs only in parchment manuscripts, in which, being of a costly material, leftovers of sheets that did not amount to the bifolium size were nevertheless utilized.[8]

Sketches of quires from Glatzer, 'Aleppo'

Figures 9-10:   A quire composed of four complete bifolia   A bifolium
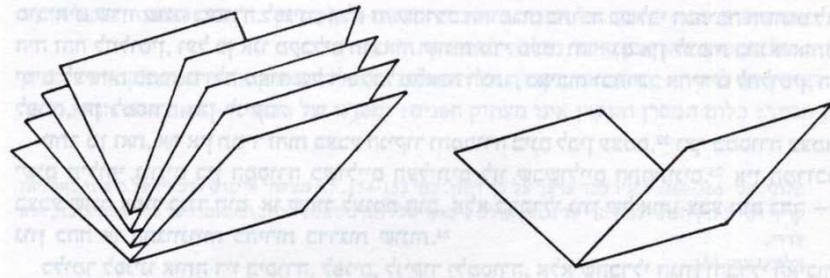
Figures 11-12:   A quire incorporating a folio and its stub   A folio and its stub
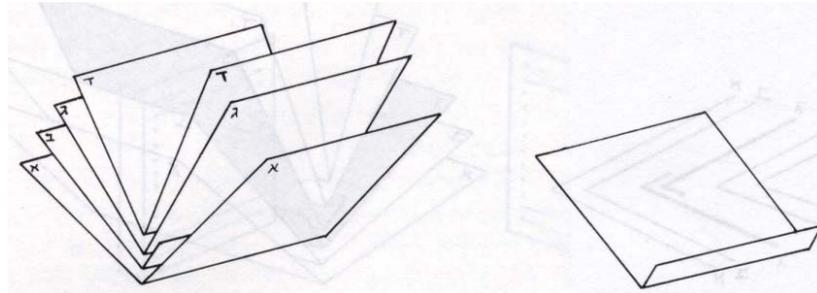
Figure 14 and 15: A typical quire of the Aleppo Codex consisting of five bifolia in which the third bifolia is comprised of two folios and their stubs
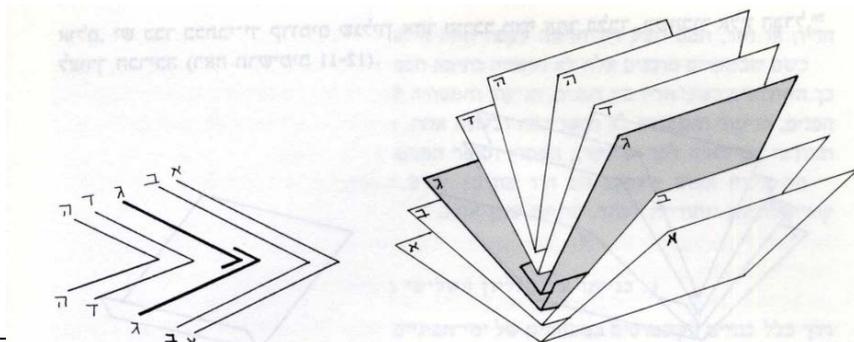
[8] On the quiring of oversize artificial bifolia, defined in European languages as in-plano (in rightly named in French 'atlas' and in Italian 'atlante'), see Muzerelle, *Vocabulaire codicologique*, par. 312.7. Among Hebrew manuscripts the rare practice of constructing quires of artificial bifolia created by pasting the stubs of two folios made of entire parchment sheets to produce vastly oversized books is known to me only from the splendid MS Berlin Ms. Or. Fol. 1210-11. The dimensions of its 1068 folios (in two volumes) are 629x470 millimetres, and all (except for one folio) are comprised of entire sheets that were pasted together to create huge bifolia. The manuscript – the largest of all the Hebrew manuscripts documented in SfarData – was produced with complex Masora ornamentations in 1343, apparently in the region of Erfurt in Germany. On this manuscript, see *Kitwe-Jad – Jüdische Handschriften: Restaurieren Bewahren, Präsentieren* [Ausstellung und Katalog P. Werner] (Ausstellungskataloge n.F. 47 a–b), Berlin 2002, vol. 1: *Jüdische Kultur im Spiegel der Berliner Sammlung*, pp. 18–22, and see also the second volume (ibid. vol. 2: J. Bispinck, *Erste Schritte der Restaurierung der Hebräischen Bibel 'Erfurt 1'*) dedicated to its restoration. And see in particularly O. Hahn, T. Wolff, H.-O. Feistel, I. Rabin & M. Beit-Arié, 'The Erfurt Hebrew Giant Bible and the Experimental XRF Analysis of Ink and Plummet Composition', *Gazette du livre médiéval*, 51 (2008), pp. 16–29.

The bifolium is the smallest codicological unit, the 'atom' of the codex, as it were, while the quire can be likened to the molecular unit of the codex. Bifolia were cut from sheets of parchment which were produced from entire skins of calves, sheep, or goats, or from sheets of paper that were produced in moulds. Evidence gathered from the aspect of parchment bifolia in a small number of Latin manuscripts from the eleventh century and onward shows that their quires were constructed by folding the parchment sheet several times according to the required size of the manuscript.[9] Such evidences were not found so far in Hebrew manuscripts; yet, admittedly, no systematic and comprehensive examination had been carried out in what concerns producing quires by folding parchment sheets then cutting the quires' edges. Obviously, both parchment and paper sheets would be folded and cut into bifolia according to the required size of the codex that was being produced, but it seems that a stack of sheets would be prepared beforehand and quiring be carried out by the random gathering and assembling of bifolia from a this heap, and not necessarily by folding the sheet into a quire. We shall see below that the odd-figured quiring,[10] prevalent in Hebrew manuscripts – unlike the

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[9] See L. Gilissen, 'La composition des cahiers, le pliage du parchemin et l'imposition', *Scriptorium*, 26 (1972), pp. 3–33; idem, *Prolégomènes à la codicologie: Recherches sur la construction des cahiers et la mise en page des Manuscrits médiévaux*, Gand 1977, pp. 13–122. Further bibliography is included in Maniaci, *Archeologia*, pp.223-224. Among later works, an article by Gumbert ('Sizes and Formats', in Maniaci & Munafò [eds., *Book Materials and Techniques*, 1, pp. 230-231) should be mentioned; there Gumbert demonstrates how the method of folding the sheet may be reconstructed according to the place where the flanks emerge visibly at the margins of the parchment folios, and also how the orientation of the marks of the animal's spine visible in the parchment bifolia attest to the format, i.e. to the number of folds of the sheet that determine the size of the book. In the folio format, the spine's trace is visible in the middle of the bifolium; in the quarto format it is visible in the middle of the bifolium's fold and parallel to it, and in the octavo format, it should be visible in the upper edge of the folio, provided that the mark were preserved after the cutting of the upper margins. See further, J.P. Gumbert, 'Skins, Sheets and Quires', in *New Directions in Later Medieval Manuscript Studies – Essays from the 1998 Harvard Conference*, ed. D.N.M. Pearsall, Woodbridge–Rochester 2000, pp. 81–90. On the possibility of measuring the thickness of parchment bifolia in order to reveal the manner of folding, see Bianchi et al., 'Facteur de variation de l'épaisseur du parchemin italien du VIIIe au XVe siècle', in Maniaci & Munafò (eds.), *Book Materials and Techniques*, vol. 1, p. 154. On the manner of folding sheets, see the figures accompanying the folding terms in Muzerelle, *Vocabulaire codicologique*, section 312.02; Gumbert, *Words for Codices*, par. 313.3.

[10] Quinions (five-bifolia quires) were the standard composition in dated Hebrew manuscripts in the Middle East (like in all Semitic manuscripts) and in the dated Hebrew manuscripts in Italy, which comprise around a third of the totality of the dated corpus. Neither is the senion (six-bifolia) composition, which had been the secondary composition used in Hebrew manuscripts in zones of Sefardic book culture (and commonly found in Latin parchment manuscripts in the 13th and 14th centuries, see below, n. 48) concurrent with the assumption that quires were created by folding the sheet. Colette Sirat proposes that

standard quaternions of Western Latin manuscripts before the ninth century – confirms the surmise that in Hebrew manuscripts quiring was not carried out by folding sheets but by a random gathering of bifolia that were cut from different sheets. This practice is attested in an eleventh-century halakhic source from Ashkenaz stating that it was the copyist who constructed the quires.[11] As to fifteenth-century Hebrew manuscripts, until this day they show no evidence that their quiring was achieved by folding, unlike their contemporaneous Latin manuscripts: there, evidences for quiring by means of folding were found, to an even greater degree than in earlier periods. These evidences demonstrate, moreover, that the quire was a copying unit, having been inscribed on a spread out sheet prior to being cut into separate bifolia.[12] Yet, one should emphasise that only in a few dozen Latin manuscripts has evidence been found of quires produced by the folding of sheets, and that in the vast majority of non-Hebrew manuscripts, be they Oriental or Latin, quires were not made this way.

Once the text had been inscribed, quires would be sewn at the bifolia folds in a variety of techniques and with different dispositions of the stitches ("stations"), according to region and time. Sometimes the original stitches[13] or replacement stitches (medieval manuscripts would be rebound several times) or only the temporary stitches would be preserved; some are still visible at the back of the quire and in its central opening. The

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the odd composition of quires (in quinions) in early non-Hebrew codices in the Orient was in fact suited to papyrus, which would be rolled into a scroll after its production, then cut into any number of sheets, whereas parchment quires created by folding the sheet required that the number of folios be an exponent of 2. See C. Sirat, 'Pour quelle raison trouve-t-on au Moyen Âge des quinions et des quaternions? – Une tentative d'explication' in Hoffman (ed), *Codicologie comparée* , pp. 131-135.

[11] אסור – לכתוב אגרת אם אדם צריך בהיתר בחולו של מועד, אבל לתקן קונטריסין מן הקלפים לכתוב אחר המועד (*Ma'ase ha-Geonim*, ed. A. Epstein & J. Freimann, Berlin 1909, p. 33 and references cited there [in Hebrew]). Regarding the identification of the transmitter of this halakha, see. A. Grossman, 'Bnei Makhir ve-sifram *"Ma'ase ha-Makhiri"'*, *Tarbiz*, 46 (1985/6), p. 131 (in Hebrew) (referred to me by Simcha Emanuel).

[12] This method of quiring was exposed following the discovery of traces of uncut edges of the bifolia, which left the bifolia unseparated. The literature describing this phenomenon abounds. See Bischoff, Latin Palaeography, p. 21; Gumbert, 'Skins, Sheets and Quires' (above, n. 9). Peter Gumbert presents evidence showing that in many Latin manuscript quaternions were not created by the folding of sheets, and concludes that until the 9th century at least, this technique of preparing quires was not in practice, and that it was rare in Oriental and Greek manuscripts. He also explains how the very existence of bridges connecting the bifolios is no proof to the making of quires by folding, and discusses the phenomenon of temporary stitching as well. Gumbert noticed an upper connection that survived in a fragment of a Latin manuscript while examining the Latin manuscripts in the Jewish National and University Library in 1991(currently the National Library of Israel) (MS Jerusalem Ms. Var. 475).

[13] Original stitchings or bindings of Hebrew manuscripts are very rare and so are renewed early bindings. See below in the current chapter under the section entitled 'Binding'.

sewing of the quires would be completed once they were tied together and the entire volume of quires bound in various methods. Here one should mention Michael Gullick's discovery of indications (both literary and material) in Latin manuscripts attesting to the fact that, at least in twelfth-century England and France, copyists used quires which bifolia had been stitched temporarily, each quire apart. One must also consider the implications of such evidence on the practice of pricking and ruling the quires using methods for concurrently ruling entire quires, consecutive bifolia, or adjacent folios.[14]

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[14] See M. Gullick, 'From Scribe to Binder: Quire Tackets in Twelfth Century European Manuscripts', in *Roger Powell, the Complete Binder: Liber amicorum*, ed. J.L. Sharpe (Bibliologia 14), Turnhout 1996, pp. 240–259. Gullick had already pointed out that Gregory, in his historical article from 1885 on the Greek quire, presented his assumption that quires were stitched provisionally (see below, n. 17). Gullick's great contribution was in showing literary evidences of provisional stitching for enabling the copying; moreover, he presented manuscripts displaying remains of such stitches (remnants of parchment strips, or of threads, or just miniscule slits or horizontal incisions created by stitches, with no threads remaining). In addition, he noticed that the stations made by provisional stitching were different from the piercing made in regular stitches, and that sometimes they would serve for the main stitching. Gullick uses 'tacket' for the provisional stitch, which, in Hebrew would be termed תֶּךְ, as used for stitch in the sewing of scrolls. See the *baraita* in the Palestinian Talmud, Megilla 2:5, 72b (according to MS Leiden): שאם תפר בה שנים או שלשה תכים שהיא כשרה; this is identical to the meaning of שלשה חוטי גידים, which appears in all textual witnesses of the parallel *baraita* in the Babylonian Talmud, B. Megilla 19a, except for two witnesses – MS New York, Columbia X893 T 141 and MS Munich Cod. hebr. 140, where one finds חכי גידים (according to the Sol and Henkind Talmud Text Databank at the Saul Lieberman Institute of Talmud Research), most probably a corruption of תכי.

In the course of a seminar on Hebrew manuscripts as compared to Latin ones conducted by J. Peter Gumbert and myself, with the collaboration of the Bodleian Library at Oxford University in the Spring of 2009, Gumbert noticed some tacket cuts at the upper and lower edges of the central folds of the preserved unbound (but re-stitched) quires in MS Oxford Heb. d.11, *Sefer ha-zikhronot*, compiled and copied by El'azar ben Asher in Germany (see above, chapter 1, n. 106). Moreover, as he carefully examined all the central bifolia folds, Gumbert found remains of the tackets themselves, made of parchment strips (see the plates above) in two quires (no. <19> and no. <32>). In Latin and Greek codices he noticed the remains of tackets in every quire of the codex. His conclusion was that this practice was most widespread in Latin manuscripts throughout Europe, at least from 800 until the central Middle-Ages. He moreover established its existence in Ethiopian manuscripts until this very day, as well as in Arabic and Byzantine codices. In his opinion, the spread of the practice of numbering quire bifolia in Latin manuscripts in the 14th century rendered obsolete the practice of tacketing single quires in order to ensure the order of the folios. For, from the moment that numbering the quires became current practice in Latin codices, unlike Hebrew codices, the number of each quire would be inscribed on every bifolium, as would eventually become the practice in printed books as well (namely, marking Ia, Ib, Ic, Id, or a mere numeral). He conjectured that tacketing was used also for ruling the quire (especially when entire quires were ruled, or several bifolia or folios were ruled in one go) and for copying, and that it was not a mere provisory action prior to final binding but sometimes also a method for producing codices out of separate unbound quires. In addition, it was an effective means for integrating single folios with their stubs into a quire. See J.P. Gumbert, 'The Tacketed Quire: An Exercise in Comparative Codicology', *Scriptorium*, 64 (2011), pp. 299–320 & pls. 50–54.

Disposition of parchment bifolia

Quires made of parchment with distinguishable sides were ordered methodically and consistently in what concerns matching the bifolia sides and the openings of the codex.[15] When only the quires' external and central bifolia were made of parchment, as seen below, this methodical and consistent disposition of the sides would be kept in the openings between one quire and the next. The conspicuous difference in the texture, or at least the hue, of parchment sides led to a wide acceptance of this practice in all civilisations of the codex, at least from the tenth century and on, namely - to arrange the bifolia prior to folding by matching their sides, hair side facing hair side and flesh side facing flesh side. Consequently, we find that the two pages showing in each opening, each belonging to a different bifolium (except for the ones in the central opening of each quire), are identical in appearance – either hair or flesh sides, in alternating order.[16] As a result one can easily discern when a folio is missing: for if the matching of the sides is disrupted and an opening displays two different sides of the

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[15] It seems that other considerations were at work, besides the aesthetic values and symmetry. On the greater thickness (according to precise measurements) of the outer folios in Latin manuscripts, see F.M. Bischoff, 'Observations sur l'emploi de differentes qualités de parchemin dans les *Manuscrits médiévaux*' in Maniaci & Munafò (eds*.), Book Materials and Techniques*, vol. 1 pp. 82-85. Cf. ibid*.* for an explanation for the fact that the holes (caused by lesions of the skin, common in parchment folios, especially non-decorative ones) are found in the inner, thinner folios.

[16] On the start of this practice in Latin manuscripts in the British Isles (known there already from the second half of the sixth century) and later in the European continent (within scriptoria under Insular influences), see Vezin, 'Réalization matérielle', pp. 26-27.

parchment facing each other, we may conjecture that a folio (or an odd number of folios) is lacking.

Astonishingly, this practice, which had been current from the tenth century or before throughout all zones and in all types of bookcraft, was observed only in late nineteenth century. It has been named 'Gregory's rule', after the scholar of Greek manuscripts who publicized it.[17] The guiding principle behind this symmetrical arrangement seems to have been aesthetic. However, Henk de Groot, a parchment maker in Rotterdam engaged in the history of parchment making, claims convincingly (as in his email from 9 July 2015) that the bifolia leaves were arranged by corresponding sides in view of the concavity of hair sides and the convexity of flesh sides (see above, chapter 3, note 44). Disposing the folios according to opposite arcs (concavity facing concavity and convexity facing convexity) neutralizes the curvature and is therefore crucial in the production of a codex as a tight block, whether closed or open and leafed through. The aesthetic aspect was, so it seems, an outcome of the codicological requirement. To quote Henk de Groot's extraordinary statement:

> I think the manuscript makers choose the parchments leaves in opposite bowing: ( )
> to neutralize the bowing of the leaves together. The result: a flat manuscript block.
> The equal colour of the openings was a lucky gift of beauty.
>   ( ) ( ) ( ) gives: IIIIII
>   ((((((gives: ((((((

It has been argued that this regularity was an outcome of constructing the quire by means of folding a parchment sheet. The scant number of early Latin codices in which quires were constructed by folding, as well as the quire structure in some of the earliest Greek and Latin codices, showing an odd number of bifolia - dispute this view. The bifolia order in the quire would usually be marked by the initials representing the flesh or hair side on every recto side in the first half of the quire, e.g. HFHFH[18] (for a quire made of five bifolia beginning with the hair side, with the openings alternately matching).

It appears that Gregory's rule, displayed in every quire of all dated Hebrew codices, had not been observed in some of the early undated manuscripts, although they too show a regular arrangement. In Geniza fragments and even in a few complete codices, all apparently from the region of Iraq, it so happens that the spread out bifolia were arranged with the hair (or flesh) facing regularly a uniform direction; in other words,

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[17] G.R. Gregory, 'Les cahiers des manuscrits grecs', *Comptes-rendus des séances de l'Académie des Inscriptions et Belles-Lettres*, vol. 29, ser. 3 (1885), pp. 264–265. Reprinted in Gilissen, *Prolégomènes à la codicologie* (above, n. 9).

[18] In Hebrew, the designation in this case would be שבשבש.

after folding, the sides did not match at each opening (except for the centre opening). Instead, flesh sides would face hair sides.[19] The assumption that this practice was typical of Babylonian manuscripts is undermined by the data concerning this method of arrangement in early Oriental and Occidental manuscripts inscribed in other scripts - Latin, Syriac, and Arabic.[20] Consequently, it seems that the method of arranging bifolia disregarding the matching of parchment sides was not zone- but time related; moreover, it could well be that all early codices in all scripts were at first arranged according to this method – imitating the papyrus codex – and that at some point (which might have been different for each region or script) bifolia came to be arranged with matching sides. Babylonian scribes might have continued to practice the old method even after Jewish scribes in other areas had adopted the new one.

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[19] I.e. according to the order HHHHH (in quinions, as practiced in the Orient), as in MS Vatican Vat. ebr. 66. the early *Sifra* manuscript with Babylonian vocalization. For more examples, see Beit-Arié, *Hebrew Codicology,* p. 41, n. 66, and see especially the article by Mordecai Glatzer, 'Early Babylonian Hebrew Manuscripts', *Gazette du livre médiévale*, 27 (1995), pp. 19–24.

[20] The methodical arrangement with no matching sides is attested also in Latin Insular manuscripts (produced on the British Isles) from the second half of the 6th century until around 700 (and later also from the 9th till the 11th century); as well as in manuscripts produced in scriptoria on the continent, especially under the influence of Insular bookcraft, see Vezin, 'Réalization matérielle', pp. 26-27. Julian Brown maintained that this quiring practice in early Insular manuscripts (which quiring by quinions may attest to Oriental influence) was affected by papyrus codices. The sheets of papyrus that were cut into bifolia were formed by strips taken from the stem of the reed, and were manufactured in two layers so that the strips of one layer were perpendicular to those of the second layer and thus they were pressed and forged together. When arranging the bifolia that had been cut from papyrus sheets, they would be laid out in such a manner that in each of the codex's openings one side displayed horizontal strips of fibre while the opposite side displayed vertical strips. Brown believes that quiring by non-matching sides in Insular manuscripts was influenced by the practice found in early Continental and Oriental manuscripts: as parchment started to be used, scribes who were not practiced in the folding of sheets were likely to create their parchment quires as was done in papyrus codices, see J. Brown, 'The Oldest Irish Manuscripts and their Late Antique Background', in *Ireland and Europe: The Early Church*, ed. P.N. Chantháin & M. Richter, Stuttgart 1984, pp. 324–325 [collected in Brown, *A Palaeographer's View*, p. 238]. According to Sebastian Brock, Gregory's Rule had not been maintained in early Syriac manuscripts produced in both the eastern and western parts of the Middle East. His view was put forward in an unpublished paper, which I thank him for letting me read: P.S. Brock, 'Saba, the Scribe "who never made a blotted tau" – Some Codicological Notes on Three Syriac Manuscripts from Redshʿaim, c. A.D. 724–726'. The arrangement of bifolia with no matching sides, namely in the HHHHH pattern (as in those same Hebrew manuscripts), was the standard arrangement in manuscripts produced in the scriptoria of Syriac monasteries of both the Eastern Church, known as the Nestorian Church, and the Western Church, known as the Jacobin or Syriac Orthodox Church, see F. Briquel-Chatonnet, 'Cahiers et signatures dans les manuscrits syriaques – Remarques sur les manuscrits de la Bibliothèque Nationale de France', in Hoffmann (ed), *Codicologie comparée*, pp. 158-159. Moreover, in a large sample of fragmented Arabic manuscripts of the Qur'an from the end of the 7th century through the middle of the 10th century it appears that most of the bifolia were arranged with non-matching sides (HHHHH). See Déroche, *Islamic Codicology*, pp. 71-76. Déroche proposes that this practice imitates the papyrus codex (ibid*.,* pp. 83-84), as Brown had already proposed before him (see above).

Illustrations of a parchment quire arranged by matching sides (with uniform appearance of each opening) and of a quire arranged with non-matching sides

From: Glatzer, 'Aleppo', p. 197
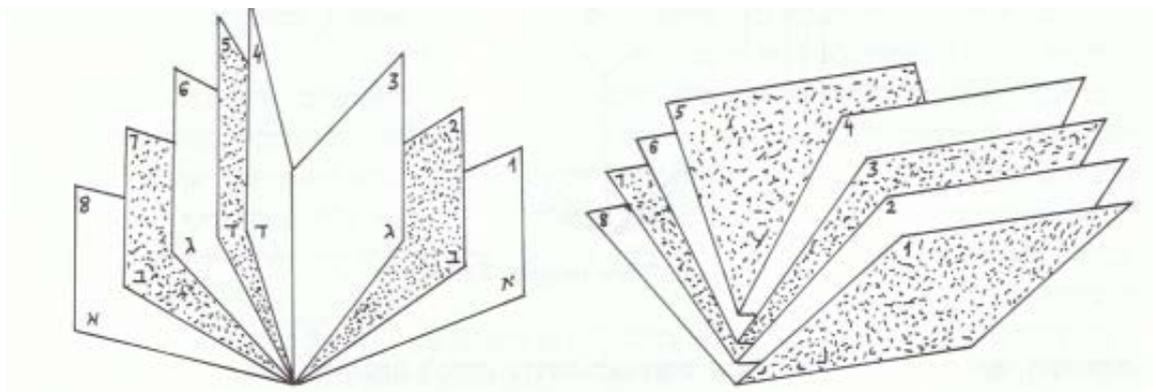
קונטרס שגיליונותיו מסודרים בהתאמה - מראה מבחוץ ומפנים
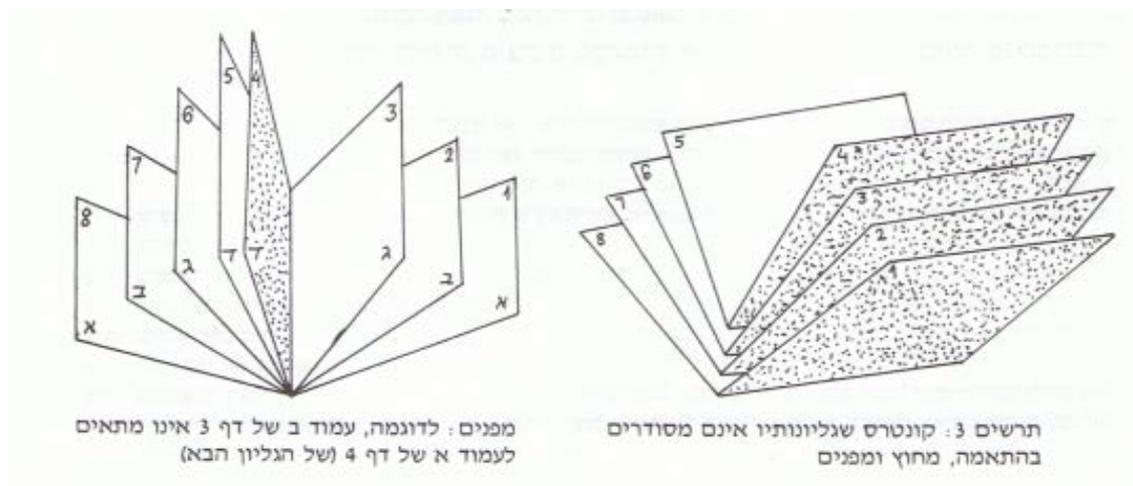
מפנים: לדוגמה, עמוד ב של דף 3 אינו מתאים
לעמוד א של דף 4 (של הגליון הבא)

תרשים 3: קונטרס שגליונותיו אינם מסודרים
בהתאמה, מחוץ ומפנים

The quire's beginning

In most Hebrew manuscripts the quire would begin with the hair side, i.e. the external surface of the outer bifolia enfolding the quire was hair side. In Italy (and rarely in Spain and Byzantium), an opposite practice prevailed as well, where quires began with the flesh side; thus, the pattern of their arrangement would be FHFHF, depending on the bifolia number. This pattern, common in Italy only, was displayed in half of the parchment manuscripts. First attested in the 1280s,[21] it spread gradually throughout the

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[21] The earliest manuscript which quires begin with the flesh side is dated 1280 (MS Parma Parm. 2052, De-Rossi Catalogue 667, Richler & Beit-Arié Catalogue [Parma] 188). Chronological data should not be accorded too much weight without taking into account the size of the corpus in this particular time period. One must keep in mind that the number of extant Italian dated manuscripts produced prior to 1280 is very small: two manuscripts from the 11th century, two from the 12th century, and eleven from the years

fourteenth century, being present in thirty percent of all parchment manuscripts produced at that time: during the first half of the century it appears in ten percent of the manuscripts only, while in the last quarter of the century it shows in one half of them.[22] During the fifteenth century almost sixty percent of Italian parchment manuscripts began with the flesh side, and in the first decades of the sixteenth century – two thirds of them did. The fact that so many of these manuscripts, produced from the turn of the fourteenth century to the end of fifteenth century, were copied by immigrant scribes – mostly Sefardic and some Ashkenazic – unaccustomed to such quire arrangement, in addition to the fact that the broad spread of the practice overlaps, since the 1420s, with the spread of ink ruling in Italy,[23] raises the question whether the rapid spread of this method of ordering the quire (practiced already in the thirteenth century) in the later period was related to the commercialized production and wholesale distribution by stationers of ruled quires during the Renaissance. For it can be assumed that immigrant scribes would acquire or be given readymade quires that had been assembled and ruled according to a method to which they were unaccustomed, and it is the local current local method of quiring and ruling that prevails in the manuscripts they copied.[24] In any event, quiring which begins with the flesh side was one of the characteristics of the Latin Humanist manuscripts in the fifteenth century, and it appears in nearly every Latin manuscript that had been inspected.[25]

While prevalent in Italy, this quiring practice appears in some dozen manuscripts from Spain, comprising around six percent of the extant Spanish parchment manuscripts, the earliest of which as produced in 1300;[26] it was found in a larger proportion (even though in a negligible number of manuscripts) in Byzantium, and for the first time in a period paralleling its first appearance in Spain. Oddly, this 'Italian' custom was not widespread in Byzantium, although it prevailed among Greek copyists in Byzantium from the ninth

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1246-1279. This said, the quiring of the first nine dated manuscripts displaying this arrangement before 1313 diverges from the standard (six or four bifolia instead of five).

[22] Interestingly, all parchment manuscripts surviving from the second and third quarter of the fourteenth century (after 1325 and before 1371/2) – 28 in number – were arranged so as they begin with the hair side.

[23] Some two thirds of ink-ruled Hebrew manuscripts from Italy begin with flesh side.

[24] See below in chapter 6, section b: Ruling, subsection 3c: Ink ruling.

[25] See Derolez, *Codicologie*, vol. 1, p. 33. Derolez noted this practice in 98.7% of 1200 humanistic parchment manuscripts he inspected and documented.

[26] MS Paris Hébreu 20, a Bible copied in Tudela (Spain) by the masorete Yehoshu'a ben Avraham Ibn Gaon, who compiled the Masora of this Bible. See *Manuscrits médiévaux* I, 25).

century and on.[27] The present discussion must exclude the small number of Ashkenazic manuscripts inscribed on parchment, in some of which bifolia one distinguishes between hair and flesh, while in some the distinction is impossible or hardly possible. The fact that in some quires it would seem possible to discern an arrangement by matching sides beginning with flesh sides is of no actual relevance since the parchment of those manuscripts was obviously manufactured in the aim of achieving an equalised appearance of both sides of the parchment (see above, chapter 3, section 1: Ashkenazic parchment).

'Gregory's Rule regarding the arrangement of parchment quires with matching sides was valid in mixed quires as well. It goes without saying that the rule does not pertain to the quire itself, but to the passage from quire to quire (clearly, the pages of the central bifolium would always present an opening of uniform appearance). Had the outer parchment bifolia of mixed quires not been arranged systematically by matching sides, the openings between quires would not display a homogeneous appearance. Indeed, we find that mixed quires always begin with the same side. In all zones, as well as in Italy, where starting the quire with the flesh side was so common, mixed quires usually begin with the hair side; therefore both the last page of the quire and the first page of the next quire display the hair side. In only a few mixed manuscripts do quires begin with flesh side. As for quires in which the central bifolium is also made of parchment – more than two thirds of them display the hair side in the centre opening, while the rest present the flesh side. There existed, therefore, in all zones, a marked preference for laying the spread out paper bifolia between parchment bifolia which outer surfaces were hair sides. Thus, to the aesthetic principle of matching sides in the interface of two quires, the principle of symmetry was added as well.

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[27] As Gregory had already remarked (above, n. 17). See also Irigoin, 'Centres de copie byzantins' (1958), p. 20. For additional information on starting with the flesh side not only in Greek but in Latin manuscripts as well, and on the revival of this practice in the 13th century, see Vezin, 'Réalization matérielle', pp. 26-27. Indeed, most of the dated and localised Latin manuscripts from France which I inspected in Parisian libraries (see above, chapter 3, n. 49) dating from the end of the 13th century to the end of the 14th century show quires beginning with flesh side. See the summary by Agati, *Introduzione alla codicologia*, p. 154. For early Latin codices which quires begin with the flesh side, see Lowe, *CLA*, vol. 1, p. X. Coptic manuscripts begin with the flesh side, as do Greek manuscripts (from the 9th century onward).

Composition of quires

The number of bifolia per quire in medieval parchment manuscripts was not high: due to the parchment's thickness it hardly ever exceeded six (twelve folios),[28] thus ensuring that the codex open handily. However, in paper quires and in mixed quires the number of bifolia could reach as many as fourteen bifolia (twenty-eight folios),[29] though normally it would not exceed ten.[30] חריגה

Inner uniformity characterises most of the Hebrew codices: their quires would usually comprise a uniform number of bifolia. Clearly, end quires of a manuscript or of a textual unit might deviate from the uniform composition and include a higher or lower number of bifolia, depending on the length of text remaining to be copied. In most manuscripts produced in each geo-cultural zone of Hebrew bookcraft, quires would be composed of an equal number of bifolia that were folded then sewn at the folding. Even when several quire compositions or a secondary composition were used in a certain area, there would be no deviation from the set of compositions practiced there. In the Middle Eastern regions, where the transition to paper was early and rapid and mixed quires were not in

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[28] A rare early example of a parchment codex with eight-bifolia quires is MS Cambridge Add. 1564 (8), copied in France in 1242-1243. However, this manuscript was inscribed on especially thin parchment, which was uncommon in Ashkenaz, and it seems that for that reason its quires were composed as a multiple of the four bifolia that were in use there.

[29] Among dated manuscripts, only two manuscripts with this rare composition were found, both of them paper manuscripts copied in Italy by immigrant scribes. The first was inscribed by a Provençal copyist in 1428, probably in southern Italy (see *Manuscrits médiévaux*, I, 68; and ibid. n. 1, in what regards the identification of its provenance); the second was copied in an Ashkenazic script in 1446 (see ibid*.,* I, 122).

[30] In the early period of the Greek and Coptic papyrus codex, quires comprised a very large number of bifolia. Irigoin mentions a Greek codex containing a 52-bifolia quire (104 folios), see J. Irigoin, 'Les cahiers des manuscrits grecs', in Hoffman (ed), *Codicologie comparée*, p. 2. The Gnostic Coptic codices from Nag Hammadi comprise one multiple-bifolia quire, see J.M. Robinson, 'Codicological Analysis of Nag Hammadi Codices V and VI and Papyrus Berlinensis 8502', in *Nag Hammadi Codices V,2-5 and VI with Papyrus Berlinensis 8502, 1 and 4,* ed. D.M. Parrott (Nag Hammadi Studies 11), Leiden 1979, p. 13. We have one example of a multiple-bifolia Hebrew quire, also made of papyrus; though produced at a later date it concurs with the late adoption of the codex: a fragment from a *piyyutim* codex, most probably from the 8th century, holding one quire which comprises at least 24 bifolia (48 folios). See Sirat, *Papyrus*, pp. 69-82 and Plate XVIII. Recently, Geniza fragments of nine entire or fragmented bifolia which survived from one parchment codex were identified. They contain Tractate Sanhedrin and parts of Megilla of the Babylonian Talmud. Owing to them, Nissim Louck was able to calculate and reconstruct the folios of the missing bifolia as well as the quire structure of the fragments. That reconstruction brought to light a fascinating yet inexplicable codicological phenomenon of a quire composed of at least 30 bifolia (60 folios). Technically it would be unthinkable to assemble such a multi-bifolium parchment quire. Due to the thickness of parchment, the traditional multi-bifolia quiring of papyrus was reduced to quaternion- and quinion quiring as soon as parchment began to be used for codices. See Sh. Efrati, 'A Quire of Chapters of Sanhedrin and Megilla of the Babylonian Talmud, Part 1: A Unique Textual Tradition of the Babylonian Talmud', *Tarbiz*, 85,1 (2018), pp. 65-144 (in Hebrew).

use, there was no significant difference in the quire composition of parchment as against paper manuscripts. The tendency to implement in paper manuscripts the quiring practiced in parchment ones was manifest in Germany, where the transition to paper was late and slow; there too, mixed quires were not in use. In other regions, the quiring of paper would be less regular than that of parchment and in many cases it would lack uniformity. Obviously, the composition of mixed quires would often be different from that of parchment or paper quires.

Unlike other codicological features, the quiring of non-Hebrew manuscripts, especially Latin ones, was widely – though not exhaustively - documented, allowing comparative discussion.[31]

The Hebrew codicology database is based on a corpus comprising extant and accessible dated manuscripts. Therefore it also includes many fragmented manuscripts (especially from the Orient), in which quire composition is unclear, as well as manuscripts which quiring lacks uniformity: these might somewhat distort the data concerning quiring drawn from the full corpus. To minimize such misrepresentation, most of the data presented below are based on a corpus that includes only non-fragmented manuscripts dated prior to 1500, in which quire composition is clear and largely uniform. In the enumeration of quire compositions which follows and in the summary of quiring practices by region presented below, the manuscript sources are indicated only when they do not pertain to the said corpus.

Three bifolia (6 folios, 12 pages) - *ternion*
Ternions are very rare yet they deserve a separate paragraph since this quiring practice was probably the only local (rather than regional) tradition in Hebrew book production. Three-bifolia quiring – namely, the smallest composition – appeared till mid-fifteenth century only in Spanish parchment manuscripts.[32] Six manuscripts showing this type of

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[31] Paula Busonero conducted a comprehensive survey in which she examined (based on catalogues) 3,410 codicological units from European countries (England included) – 386 from the 12th century, 387 from the 13th century, 620 from the 14th century, and 1,767 from the 15th century. For details of the survey and its findings, see Busonero, 'Fascicolazione'.

[32] If we ignore, with good reason, this quiring in the Ashkenazic rite maḥzor copied in Germany in 1322, MS Parma Parm. 3267–3268 [mistakenly documented as 5267-5268 in Beit-Arié, *Hebrew Codicology*, p. 43] (De-Rossi Catalogue 442). The quires in both its volumes were not composed of bifolia but of folios and stubs pieced together from parchment fragments, so that each pair of folios attached by their stubs created an artificial bifolium. The construction of entire quires from folios and their stubs is unusual: normally a quire would include no more than one bifolium constructed of paired separate folios aided by their stubs, as in the ancient Aleppo Codex (above, n. 7). A construction like that of MS Parma

quiring, all of them Bibles, were inscribed between the late twelfth century and 1300 in Toledo; four of them were localised explicitly in the colophon, one was localised by its decorations and based on its attribution in a sixteenth-century deed of sale to a copyist belonging to a family of scribes active in Toledo, and another one was localised based on the blessing formula ישע יקרב, attached to the dates in Toledo colophons.[33] It is possible to surmise, therefore, that quiring by ternions was a local tradition of the Toledo school until around 1300, which nevertheless did not supplant the pan-Iberian custom of quaternions. Presumably, this practice of quiring derived from a local Arab tradition of production that had crystallized when Toledo was under Muslim rule, as conveyed by the similar composition of quires that was common to many Arabic manuscripts from the Western Muslim regions.[34]

Four bifolia (8 folios, 16 pages) - *quaternion*

Quaternions were the standard composition found in early Latin manuscripts until the ninth century, with the exception of a few very early manuscripts which show quinions, similar to the quire composition of manuscripts produced in the Orient and of those produced in the British Isles.[35]

This composition was common practice in Hebrew parchment codices in several zones, but was much less current in codices made of paper, which allows a greater

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would have thickened the folds of the quires and consequently the manuscript itself, and the scribe must have therefore reduced the number of artificial bifolia per quire. Another manuscript that was produced out of Spain (Rome, 1323) and comprises ternion quiring is MS Parma Parm. 3099, 3119, 3126 (De-Rossi Catalogue 692-694), but here the uncommon quiring is secondary, appearing in one third of the quires while the rest display a composition typical for Italy in all periods (quinions).

[33] For the manuscripts' details, see Beit-Arié, *Hebrew Codicology*, p. 43, n. 71-72. In addition to these manuscripts we have three uncolophoned manuscripts: MS Oxford MS. Poc. 281 (Neubauer Catalogue 104, Cf. Neubauer & Beit-Arié Catalogue for the same entry, where the identification is proposed); MS St. Petersburg Евр. II B 53; MS Cape Town, South African Library, Grey collection 6B1.

[34] For ternion quiring in Arabic parchment manuscripts in the Maghreb and in the Islamic zones at large see P. Orsatti, 'Le manuscrit islamique: Caractéristiques matérielles et typologie', in Maniaci & Munafò (eds.), *Book Materials and Techniques*, vol. 2, pp. 297-298. See also F. Déroche, 'L'emploi du parchemin dans les manuscrits islamiques – Quelques remarques liminaires', in *The Codicology of Islamic Manuscripts: Proceedings of the Second Conference of al-Furkān Islamic Heritage Foundation, 4–5 December 1993*, ed. Y. Dutton, London 1995, p. 36, and also Déroche, *Islamic Codicology*, p. 79 (where he cites Orsatti). A more comprehensive documentation of the Arabic manuscripts could shed light on the Hebrew custom and its roots. The Yahuda collection of Arabic manuscripts in the National Library of Israel holds a manuscript of the Qur'an – Yah. Ms. Ar. 26, inscribed in Spain during the 12th century with ternion quiring; see E. Wust, *Catalogue of the Arabic, Persian, and Turkish Manuscripts of the National Library of Israel*, vol. 1, Leiden-Boston 2017, pp. 70-72.

[35] See Lowe, *CLA*, vol. 1, p. X, vol. 2, pp. vi-vii, vol. 4, p. viii. Cf. Bischoff, *Latin Palaeography*, p. 20.

number of bifolia in a quire. It exists only in a few manuscripts with mixed quires that were all (with one exception) produced in Byzantium

Apart from a small number of manuscripts with unusual compositions, this is the standard quiring in (Ashkenazic) parchment manuscripts. It shows in almost all Ashkenazic parchment manuscripts comprised in the aforementioned dated corpus, from the very earliest ones inscribed in the last quarter of the twelfth century (and even before, in undated manuscripts), with a constant rate of use in course of the centuries, reaching 93% percent of the corpus.[36] The quaternion composition is attested in a rare literary source from Germany, contemporaneous with the earliest dated manuscripts from this region, which is contained in the commentary to the *piyyut* אשר בגלל אבות recited on *Simḥat Tora* (the final day of the Festival of Sukkot) before the Tora reading, in a commentary to the *siddur* by Elʿazar ben Yehuda of Worms, the author of ha-*Roke'aḥ*, a highly prominent figure of Ashkenazic piety: ימין ה' טפחיים בלוחות >וימין משה טפחיים בלוחות כי ארך הלוחות שישה טפחים טפחיים טפחיים מפורש בין יד ליד>: <...> טפחים מפורש בין יד ליד שהיה כתוב ב' טפחים בלוחות, הן ח' אצבעות בבוהן. **לכך התקינו ח' דפין בקונטריס**.[37] The extent to which this composition was ingrained in Ashkenazic bookcraft can be deduced from its prevalence in paper codices. While in most zones paper codices display non-uniformity and a great variety of compositions, in Ashkenaz almost half of them are quired, just like the parchment quires, in quaternions, even though the thinness of the paper would allow a larger number of bifolia per quire.

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[36] According to Busonero's survey, this rate is identical to the rate of quaternion quiring in European Latin manuscripts (England included) in the second half of the 12th century; see Busonero, 'Fascicolazione'. The incidence of this composition in Latin codices over the centuries in various countries is unstable and smaller than that witnessed in Hebrew manuscripts. On the nearly exclusive method of quaternion quiring until the end of the monastic period of Latin manuscript production, see Ornato, *Apologia*, p. 34. Ornato proposes an explanation for the hegemony of the quaternion throughout Europe in connection with the use of the technique of ruling by hard point (see below), which, during the Carolingian period, was applied mainly by the simultaneous ruling of four bifolia stacked one above the other. This composition was therefore suited to the ruling method.

[37] Published by M. L. Katzenellenbogen, 'Perush ve-'ata horeta u-fiyyutei simḥat tora le-rabbi Elʿazar mi-Germaiza baʿal ha-Roqeaḥ' in *Sefer Refa'el – ma'amarim u-meḥqarim ba-tora u-ve-mada´ei ha-yahadut le-zikhro shel d"r Yitzḥaq Refa'el*, ed. J.E. Mowshowitz, special issue of *Sinai*, 123-124 (2000), p. 490 (in Hebrew). The commentary was composed very close to the Crusade of 1188. Referred to me by Simḥa Emmanuel, who has enriched me unremmitingly with rare sources from rabbinical literature that illuminate the unrevealed world of medieval bookcraft. The words of the *piyyut* (cf. *Maḥzor sukkot shemini ʿatzeret ve-simḥat tora le-fi minhagei benei ashkenaz le-khol ʿanfeihem*, ed. D. Goldschmidt and Y. Frankel, Jerusalem 1981, p. 471 [in Hebrew]) are based on Jerusalem Talmud Ta´anit 4:5, fol. 68:3, and according to the *baraita* in B. Bekhorot 39b: אצבע שאמרו – אחד מארבעה בטפח של כל אדם.

The quarternion quiring in parchment manuscripts was very common in Sefardic zones of the codex culture as well, though less than in Ashkenaz. Generally speaking, some 80 percent of Sefardic parchment codices are comprised of quaternions[38], with a rather constant rate of distribution over time, while only four percent of the numerous Sefardic paper manuscripts display this composition.

Quiring by quaternions is found in almost all extant parchment manuscripts from Byzantium, which are not numerous.[39] This was also the common quire composition in Greek manuscripts since the ninth-century Byzantine Renaissance and onward, and it is present already in a few of the earliest surviving codices, the famous Codex Sinaiticus included;[40] however, it is not the most common among the variety of compositions found in Hebrew paper Byzantine manuscripts.

In the Middle East, with the exception of Iran and its neighbouring areas, quaternions were rare in both parchment and paper Hebrew manuscripts. However, quaternion quiring is shared by most of the manuscripts – all but one of paper – produced in Iran and Uzbekistan (Bukhara and Samarkand), according to localised or localisable manuscripts or those which provenance can be deduced from other data. In this region, quiring by quinions - in accordance with the Oriental practice - appears in a handful of manuscripts only (of which at least two were produced in Azerbaijan,[41] the north-western part of Iran bordering on Iraq). However, one should be cautious in deducing this on the basis of very few Persian manuscripts in Hebrew script: from among a totality of merely 29 dated codices (one of them undated yet datable, based on a dated manuscript inscribed by the same hand), only 16 are non-fragmented and allow one to verify their quiring. Of these, 13 are comprised of quaternions (two manuscripts out of

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[38] Table 17 below shows that 14% of all Sefardic manuscripts were quired by senions – a secondary practice that began to appear in the final quarter of the 13th century. Until then quaternions were the only prevailing composition. See further below, in the section discussing senion quiring, and in the summary section on Sefardic methods of quiring.

[39] The dated ones with clear quiring composition amount to no more than 25; out of them, 3 show a different composition.

[40] See Irigoin, 'Les cahiers des manuscrits grecs' (above, n. 30), pp. 5-7.

[41] MS St. Petersburg Евр. II A. 113, produced in כוי (Khvoy/Khoy) in1303, and MS Oxford MS. Hunt. 567 (Neubauer Catalogue 608), produced in Tabriz (currently in Iran) in1310. Another two manuscripts which location of production is unknown or unidentified (possibly the region of Azerbaijan) are: MS Oxford MS. Poc. 260 (Neubauer Catalogue 400) dated 1221/2, and MS Jerusalem Heb. 4° 5767, produced in1328 in סמבדגאן, which has not been identified with certainty (See *Sefer Pitron Torah: Collection of Midrashim and Interpretations, Facsimile Edition of a Manuscript of The Jewish National and University Library Heb. 4° 5767*, with an introduction by M. Beit-Arié, Jerusalem 1995 [in Hebrew]). In MS Jerusalem the composition is mixed – both quaternions and quinions.

them are mixed with quinions), and among them only three are quired according to the Oriental practice. This reservation ceases to exist once we consider the data on the quiring of Arabic and Persian manuscripts produced in Iran at that time. These data seem to be clear-cut – the quiring practice in Iran was indeed by quaternions.[42]

In Italy quaternions are quite rare. They appear only from the last decade of the fourteenth century, especially in parchment manuscripts (from the end of the fourteenth century until 1500, 14% display this composition), however, most of the Italian manuscripts using this quire composition were produced by immigrants from France and Germany and especially from Provence and Spain, who would settle in Northern Italy following the expulsion from France and the persecutions in Spain in 1391. The first four decades of the sixteenth century saw a steep increase in the ratio of dated paper manuscripts with this quire composition (27%). Such a change should be attributed to the spread of print and the standardisation of quiring in printed books, with the emergence of the technique of imposition.

Five bifolia (10 folios, 20 pages) - *quinion*

The Latin term *quinternus* for describing the five-bifolia quire was the source of the Hebrew term קונטרס. It seems that it first appeared in Rashi's commentary on the Talmud, although quinions were not practiced in the Ashkenazic zone: it was the

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[42] While inspecting the collections of the Bodleian Library, this was the quiring I found in all the explicitly dated and localised Persian and Arabic manuscripts produced in Iran. That this had been the prevalent quiring in Persian and Arabic manuscripts from Iran can be deduced from their descriptions in the catalogue of the collections in the Bibliothèque nationale de France, see: F. Richard, *Catalogue des manuscrits persans, vol. 1: Ancien fonds, Bibliothèque nationale [de France], Département des manuscrits*, Paris 1989. Quaternions are also found in early Qur'ans from Iran, according to their description in the catalogue of the exhibition of Qur'ans in the British Library; see M. Lings & Y. H. Safadi, *The Qur'ān: Catalogue of an Exhibition of Qur'ān Manuscripts at the British Library, 3 April–15 August 1976*, London 1976, p. 14. Déroche found that 70% of the Arabic paper manuscripts he inspected in the Bibliothèque nationale de France were quinion-quired, see Déroche, *Islamic Codicology*, p. 87 (on the vast majority of quinion-quired parchment manuscripts in the collection of that library and in the Damascus Geniza kept in Istanbul, cf. ibid*.,* pp. 74-75). As against them, most Persian manuscripts produced from the 13th century (and even before) and until the 16th century were quired by quaternions (see ibid*.,* p. 93). Déroche & Richard ('Du parchemin au papier', pp. 192-195) presented data indicating that the practice of quaternion quiring crystallized in Persian paper manuscripts only in the second half of the 13th century and, indeed, these data are consistent with those found in Hebrew manuscripts. In fact, the earliest quaternion-quired Hebrew manuscript, possibly produced in the region of Iran, was produced in 1190 (MS Oxford MS. Poc. 96, Neubauer Catalogue 1225); the same copyist produced the undated MS Oxford MS. Hunt. 135 (Neubauer Catalogue 550), also quired by quaternions. Quaternion quiring might have emerged even earlier, as could be suggested by MS Jerusalem Heb. 8° 2238, produced in 1106, most probably in Iran, and containing a decorated version of the s*helaḥ-lekha* Pentateuch portion. Its first and last quires are quaternions and in between them - two quinions. See *Codices hebraicis*, Part III, Manuscrit 50.

standard quire composition in the Middle East (except for Iran and its environs, as noted), regardless of the writing material, as well as in Italy in parchment codices, from the earliest extant dated manuscripts (the beginning of the tenth century in the Orient, the last quarter of the eleventh century in Italy) and until the end of the Middle Ages. Only thirteen parchment manuscripts produced in the Middle East (except for Yemen) clearly display a uniform quire structure: all of them are biblical and all were produced from the beginning of the tenth century until 1327 (most of them until 1029). Ten of them are quinion-quired and three are made of quaternions (two of these were inscribed by immigrant copyists from Spain and North Africa who employed their own quiring tradition; one was inscribed by a scribe who, several years later, would quire by quinions). In the Yemenite parchment manuscripts the quinion structure was the standard, though in two of them we find quaternions. In Oriental paper manuscripts the rate of quinions is 81 percent (91 percent in Yemen). Their rate in Italian parchment quires reaches 84 percent,[43] and it would reach 94% if we excluded parchment manuscripts inscribed by immigrant scribes from France, Germany, Provence, and Spain (some of whom would have been likely to construct the quires according to their native traditions).

In Spain, and in especially in Ashkenaz, quinion quiring was rare. While in Spain they have been documented in nineteen dated manuscripts - six of parchment and thirteen of paper, and in a few uncolophoned manuscripts from the thirteenth century onwards,[44] in the Franco-German lands this composition is absent from the dated manuscripts (with the exception of one fifteenth-century manuscript), and has been observed in a few undated manuscripts produced before the fourteenth century. One of the Ashkenazic manuscripts is an undated codex containing the Prophets and Hagiographa, with no indication of the copyist's name, but its appearance attests to a very early production.[45] The composition of most if its quires may indicate that the quinion form was used in Ashkenaz in an earlier period, as attested by the term קונטרס.

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[43] As against 29% in paper manuscripts.

[44] Most Latin manuscripts inscribed in Latin script in Seville in the years 1393-1500 were quired by quinions (around two thirds of them) and only a quarter of them are senion-quired. See M.L. Pardo Rodríguez & E.E. Rodríguez Díaz, 'La producción libraria en Sevilla durante el siglo XV: Artesanos y manuscritos', in *Scribi e colofoni* (above, ch. 2, note 211), pp. 201–202, 216.

[45] MS Vienna, ÖNB Cod. Hebr. 15 (Schwarz Catalogue 4). Its parchment processing and its script attest to its antiquity. For the digitized manuscript see:
http://web.nli.org.il/sites/NLI/Hebrew/digitallibrary/pages/viewer.aspx?presentorid=MANUSCRIPTS&docid=PNX_MANUSCRIPTS000169177-1

Quinions were the standard composition of Middle Eastern codices in all Semitic scripts, including some of the early Greek and Latin manuscripts produced there in the first centuries of the Common Era. The earliest codices produced in the Orient in a Semitic script were written in Syriac, and apparently all Syriac codices were quired by quinions from the very earliest dated manuscript produced in 411-412.[46] Later, the Arabic codex emerged, and Karabacek already emphasized the quinion structure of these codices.[47] It appears that the Christian Syriac codex inspired the production and design of the Hebrew codex in the Orient and was also the model for the crystallization of the Arabic Muslim codex.

Six bifolia (12 folios, 24 pages) - *senion*

Senions were not common in Hebrew parchment codices but abounded in paper ones. Nevertheless, this was the most typical composition in Latin parchment codices in Western Europe from the thirteenth century onward. Its incidence in parchment was greatly reduced in the fifteenth century, when it became very common in paper manuscripts.[48]

Senions were the commonest composition of paper manuscripts produced in the zones of Sefardic book culture, appearing in almost half of them (45 percent). In Sefardic parchment codices they were secondary to quaternions since 1275,[49] yet their rate in the years 1275-1500 reached 15% only.

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[46] See Briquel-Chatonnet (above, n. 20), pp. 155, 159 (nearly all the Syriac manuscripts in the British Library and in the Bibliothèque nationale de France); Brock, 'The Art of the Scribe', (above, chapter 1, n. 51): 'vast majority'. Cf. M.H. Goshen-Gottstein, *Syriac Manuscripts in the Harvard College Library – A Catalogue* (Harvard Semitic Studies 23), Missoula, Mont. 1979, p. 25, note 55. However, according to other scholars some Syriac manuscripts, especially early ones, were quired by quaternions. See W.H.P. Hatch, *An Album of Dated Syriac Manuscripts*, Boston 1946, p. 23; M. Mundell Mango, 'The Production of Syriac Manuscripts, 400–700 AD', *Scrittura, libri e testi nelle aree provinciali di Bisanzio – Atti del seminario di Erice (18–25 settembre 1988)*, ed. G. Cavallo, G. De Gregorio & M. Maniaci, vol. 1, Spoleto 1991, p. 163.

[47] Déroche, *Manuscrits du Coran*, p. 20, n. 6; Déroche, 'L'emploi du parchemin dans les manuscrits islamiques' (above, n. 34), p. 30; Déroche & Richard, 'Du parchemin au papier', pp. 187-188, and cf. the article by Colette Sirat 'Pour quelle raison trouve-t-on au Moyen Âge des quinions et des quaternions?' (see above, n. 10), pp. 131-135.

[48] According to Paula Busonero's survey its rates are as follows (percentages rounded to the closest integer): in 13th century England – 51%; in 13th century France – 32%, in the 14th century – 47%; in the 15th century in parchment manuscripts – 9%, and 61% in paper manuscripts; in 13th-century Italy – 41%, in the 14th century 22%, and only 3% in the 15th century, yet 20% in mixed quires; in 15th-century Germany a total of 72% (21% parchment, 86% paper). See Busonero, 'Fascicolazione'.

[49] MS Vatican Ross. 601 inscribed in Huesca. The earliest extant paper manuscript with this composition was produced around the same time, in 1282.

Senions were the main composition used in paper manuscripts produced in the Byzantine zone, and their rate (48%) is slightly higher than in the Sefardic zones. In Ashkenaz senions appear in a few parchment manuscripts, but in more than one third of the relatively few paper manuscripts, and similarly in Italy – this composition is found only in a few parchment codices but in about a quarter of paper ones.[50] Only in the Orient was this composition hardly ever used.

The senions was the minimal structure suited for constructing mixed quires of parchment and paper (only a handful of codices were composed of smaller quires). As we shall see, this composition was not the most common in zones where mixed quiring was used, yet it was fairly common in the Byzantine zone (22 percent)[51] and scarce in Italy and in Spain.

Seven bifolia (14 folios, 28 pages)
A very rare composition. In our corpus it is found in seventeen paper manuscripts, in thirteen mixed-quire manuscripts from Spain, Italy, and Byzantium, and in one Italian parchment codex.

Eight bifolia (16 folios, 32 pages)
Eight-bifolia quiring was common in paper quires as well as in mixed parchment and paper quires in Spain, Byzantium, and Italy during the fourteenth and fifteenth centuries. In Sefarad this structure was used in around one third of paper and of mixed-quire manuscripts; in Byzantium in 23 percent of paper manuscripts and in 39 percent of mixed-quire manuscripts; and in Italy in one quarter of paper manuscripts and in around one third of mixed-quire manuscripts. In all of these regions the eight-bifolia composition was not the commonest, and although it existed its incidence was lower than that of other quiring structures.

Nine bifolia (18 folios, 36 pages)

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[50] Interestingly, seven of the ten earliest dated Italian manuscripts, produced between 1288 and 1325 (including the 3 earliest ones), which quires begin with the flesh side (as well as several undated manuscripts that include the copyist's name), are quired by senions.

[51] This is the composition used in the earliest extant manuscript containing mixed quiring (paper and parchment quires) – a Byzantine manuscript produced in Alexandria in 1212 (see above, chapter 3, in the text referenced by n. 124 and in the note itself).

Nine-bifolia quiring was extremely rare, appearing solely in paper codices and mixed-quire codices produced in Sefarad and Italy. Only fifteen dated manuscripts with this composition were found.

Ten bifolia (20 folios, 40 pages)
Forty-eight paper and especially mixed-quire manuscripts containing ten-bifolia quires have been found in all zones except for the Orient and Yemen, more especially in Sefarad and Italy, aside from one manuscript inscribed in Sefardic script in Jerusalem at the end of the 15th century.

Eleven to fourteen bifolia (22-28 folios, 44-56 pages)
Such compositions made of numerous bifolia were very rare, occurring only in paper manuscripts and in manuscripts with mixed parchment and paper quires. Altogether, eighteen manuscripts showing this quiring were found in Sefarad and Italy (and one manuscript produced in the Orient in a Sefardic script).

Accordingly, parchment codices in all regions would be composed of quires comprising, in most cases, a uniform number of bifolia, especially quaternions (in Ashkenaz, Sefarad, and Byzantium) or quinions (in the Middle East, including Yemen, and in Italy). In all these regions quiring would be limited to six bifolia at the most (apart from a small number of manuscripts). In the Orient, and to a great extent in Ashkenaz as well, paper quires would usually be constructed like parchment ones, while in other regions we find diverse compositions with certain regional preferences for this or that composition. The mixed quires present a larger variety of compositions.

Summary of quiring practices in Hebrew manuscripts according to geo-cultural zones

Middle Eastern territories (including Yemen)
In Oriental codices quires were composed of a modest number of bifolia, regardless of their writing material. During the course of the Middle-Ages, ever since the beginning of the tenth century, their standard quiring would be quinions, except for the regions of Iran and Uzbekistan where quaternions were current from the fourteenth century at the

latest.[52] In this geo-cultural zone, the rate of quinion-quired manuscripts reached some 80%. The rest would comprise mainly quaternions (which was, as noted, the standard composition in the regions of Iran and Uzbekistan), or senions.

Parchment quires were arranged by matching sides, each quire starting on the hair side.

Ashkenazic zone (France and German lands)

Apart from a few exceptions, parchment codices in these areas would use quaternions as the standard composition in all periods. During the thirteenth and the fourteenth centuries, 93% of all parchment manuscripts showed this construction, rising to 94% in the fifteenth century. The dominant incidence of this quiring in France and Germany does not correlate with its rate among Latin manuscripts before the fifteenth century, nor does it correspond to their heterogeneous quiring, thus casting doubts as to the degree of influence Latin manuscripts had on Hebrew bookcraft in these regions.[53] This was also the prevalent quiring in paper manuscripts in these regions (41%), with 36% of them being comprised of senions.

Quires made of parchment with distinguishable sides were arranged with matching sides, each quire beginning on the hair side.

Italy

Parchment manuscripts. The standard quiring of Italian parchment manuscripts in all periods was by quinions, analogous to the Oriental practice and unlike the quaternion-quiring which characterized all the other Jewish geo-cultural regions in Europe. It shows in nearly all manuscripts produced by Italian scribes, its rate being higher than

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[52] Quinion quiring corresponds to the Syriac and Arabic practice. Divergence from the Pan-Oriental custom in the region of Iran is in keeping with the custom practiced in Persian manuscripts, as it crystallized during the second half of the 13th century. The few Arabic-Christian manuscripts which quiring has been examined reveal quaternion quiring, see J. Grand'Henry, 'Les signatures dans les manuscrits arabes chrétiens du Sinaï – Un premier sondage', in Hoffmann (ed), *Codicologie comparée*, pp. 199-204.

[53] Rates of quire compositions in Latin manuscripts according to the survey in Busonero, 'Fascicolazione' are as follows: quaternions in 13th century France reached 44% only (with 32% senions) of all manuscripts in that period; in the 14th century – 45% quaternions (with senions slightly more common); and only in the 15th century did quaternions reach a large diffusion, namely 71% of all manuscripts and 90% of parchment manuscripts (61% of paper manuscripts being senion-quired). In 15th-century Germany (witnesses from earlier centuries are few) quaternions appear in 13% only of the totality of manuscripts: in parchment manuscripts the rate of quaternions is 54%; of quinions - 25%; and of senions – 21%; in paper manuscripts the rate of senions is 86%, of quinions - 11%; and only 2 percent (!) of quaternions. Different data on the composition of parchment manuscripts in France in the 14th century (although the trend is analogous) are presented by Bozzolo & Ornato, *Codicologie quantitative*, p. 132: 57% of the manuscripts in their corpus show senion quiring while 27% show quaternions.

that of the standard quinion quiring in the Middle East, and slightly lower than that of the standard quiring (by quaternions) in Ashkenaz.

Although the earliest dated manuscripts that have survived from Italy from the final quarter of the eleventh century and until the 1280s present a uniform quinion composition, their minute number before the middle of the thirteenth century raises doubts as to our ability to determine whether this was the only composition used in the early era.[54] This doubt is greatly reinforced when examining the quiring of non-colophoned manuscripts produced in Italy in the late eleventh century (some of which were copied by the same scribes who copied the dated manuscripts). Such probing reveals that the majority used quires of even-numbered bifolia: three of these early codices were composed of senions, two of quaternions, and two of mixed composition with both quaternions and quinions.[55] It emerges that quiring was not standardised in the early era, and one same scribe could produce two manuscripts with different compositions. However, one may also assume that during the early period of Hebrew codex production in Italy (which may be dubbed the 'Carolingian' period), the standard quire used was of evenly numbered bifolia – senions or quaternions – just as the quaternion composition in Latin manuscripts was standard with almost no exception in nearly all of Italy's cultural regions, as well as in Greek manuscripts produced in

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[54] Only 5 dated manuscripts produced prior to 1252 have survived. For the 4 that survived from 1072/3 to 1145 see *Codices hebraicis*, Part II, Manuscrit 38, Part II, mss. 43, 48, 71.

[55] Senion compositions: in most quires of MS Parm. 3173 (De-Rossi Catalogue 138) known as 'Parma manuscript A of the Mishna'. Small portions of this manuscript were copied by the same scribe who copied the earliest dated Italian manuscript in 1072/3 (MS Vatican Vat. ebr. 31 of the *Sifra*, which was quinion-quired, see *Codices hebraicis*, Part II, Manuscrit 38). According to the Italian glosses inscribed in Hebrew script on its margins, it was copied in Otranto in southern Italy (See Richler & Beit-Arié Catalogue [Vatican] 710); MS Parma Parm. 3259 (De-Rossi Catalogue 139 of the *Sifra*, inscribed by the same scribe, containing also several pages inscribed by the scribe of the aforementioned MS Vatican (these identifications were not noted in Richler & Beit-Arié Catalogue [Parma] 694); MS London Add. 27169 (Margoliouth Catalogue 340), which was dated based on a manuscript inscribed in 10901/1 (*Codices hebraicis*, Part III, Manuscrit 43). Quaternion compositions: first and foremost the famous Kaufmann manuscript of the Mishna kept in the Library of the Hungarian Academy of Sciences (See M. Beit-Arié, 'Ms. Kaufmann of the Mishna - Its Date and Locality', in *Collection of Papers on Tanaitic Language*, vol. 2, Jerusalem 1980, pp. 84-99 [in Hebrew]); MS Vatican Vat. ebr. 32 containing *Midrash Va-yiqra rabba* and *Sifre*, which may even predate the MS Vatican of *Sifra*. Mixed composition of quaternions and quinions: the famous manuscript of Bereshit Rabba, MS Vatican Vat. ebr. 30, containing 12 quinions and 9 quaternions; MS Vatican Urb. ebr. 2 of the Bible with a fabricated colophon, supposedly from 978/9, inscribed by a later scribe who completed the manuscript, yet its antiquity is unquestionable.

southern Italy;[56] only during the course of the eleventh century was it to be replaced gradually by an odd quire composition.

The assumption that differences in quiring practices in the eleventh century were regional and that the early even-bifolia composition was standard in Hebrew manuscripts that were produced in southern Byzantine Italy (namely, in Puglia and Campania), which had been the site of Italian Jewry's scholarship centres from the tenth century until their destruction in the thirteenth century and the site of the production of several senion-quired manuscripts, is not based on numerous manuscripts; moreover, it is undermined by the fact that the earliest quinion-quired dated manuscript had, most probably, also been inscribed in Puglia.

The great uniformity of Hebrew manuscript quiring in Italy, namely the quinion composition – which had been evidenced increasingly as from the mid-thirteenth century – is in conflict with the practices displayed in Latin manuscripts in Italy from the thirteenth to the fifteenth centuries. The rate of quinion-quired Hebrew manuscripts produced in Italy, except for the few manuscripts inscribed by immigrants, is 92 percent, yet only 21 percent of the Latin parchment manuscripts produced there (according to Busonero's survey) share that same construction, the most common compositions being quaternions (41 percent) or senions (34.5 percent). The incidence of quinion quiring in Hebrew codices is stable from the thirteenth century onwards, increasing moderately: 84 percent in the thirteenth century, 90 percent in the fourteenth century (70 percent before mid-century and 97 percent in the latter half century), 94 percent in the fifteenth century (without noticeable differences over the course of the century). As opposed to Hebrew scribes, who were adverse to innovation, the Latin manuscripts in Busonero's survey reflect a dynamics of change over the centuries: in the fourteenth century quinion quiring more than doubled its incidence to 44%, rising to become the standard quiring in the fifteenth century (75 percent).[57]

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[56] See F. Bianchi et al., 'La structure matérielle du codex dans les principales aires culturelles de l'Italie du XIe Siècle', in Maniaci & Munafò (eds.), *Book Materials and Techniques*, vol. 2, p. 412 (for details on the corpus of manuscripts on which this study was based, see ibid*.,* pp. 365-367). In previous centuries as well quaternion quiring had been standard practice in southern Italy, see E.A. Loew, *The Beneventan Script: A History of the South Italian Minuscule*, Oxford 1914, p. 290. The same can be inferred from Tristano's study, 'Caratteristiche tecnico-formali', pp. 55-89. A quick examination of Munk Olsen's monumental catalogue (B. Munk Olsen, *L'étude des auteurs classiques latins aux XIe et XIIe siècles*, vols. 1–3 [5 parts], Paris 1982–1989) shows that quaternions were the standard quiring across Western Europe during the 11th and 12th centuries.

[57] Derolez found a similar rate (*Codicologie*, vol. 1, p. 35) among the 1200 humanistic parchment manuscripts from the 15th century (77.8%). The data on quiring in a smaller corpus analysed by

As I have indicated above (note 21), the nine earliest dated Hebrew manuscripts which quires began with the flesh side (from 1280 to 1313) diverge in terms of quire composition from the standard quinion, and show quaternions or senions, as do most of the Latin manuscripts.[58]

Parchment quires are arranged according to matching sides. Before 1280 quires began with the hair side; later, the practice of beginning the quire with the flesh side started to spread. It reached its climax in the fifteenth century, encompassing sixty percent of the manuscripts.

Paper manuscripts and mixed paper and parchment manuscripts. The quiring of paper or paper and parchment codices shows a variety of compositions and, unlike parchment quires, had no standard method. The earliest extant paper manuscript[59] was composed of quaternions and quinions, thus indicating the divergence, already at that early stage, of the paper codex from the uniformity and regularity of quiring practices in parchment.[60] Less than a third of all the paper manuscripts in the corpus – nearly all from the fifteenth century and from the first two decades of the sixteenth century – were constructed according to the usual quinion quiring of parchment manuscripts. Although the presence of quinions was not very broadly diffused as yet, its use was the most prevalent. Close to a quarter of these manuscripts were senion-quired, with a similar rate of eight-bifolium quires in this group. Other compositions (seven-bifolium, nine-bifolium, and more) were used in a negligible number of manuscripts. The composition

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Casagranda Mazzoli, and Ornato – who were chiefly interested in comparing 'monastic' manuscripts with humanistic manuscripts – clearly indicate the survival of quaternion quiring among non-humanistic manuscripts, despite the increased spread of the quinion, see M.A. Casagrande Mazzoli & E. Ornato, 'Elementi per la tipologia del manoscritto quattrocentesco dell'Italia centro-settentrionale', in Busonero (ed.), *La fabbrica del codice*, pp. 207-287. Emphasis should be given to Ornato's explanation (*Apologia*, p. 65) that what originated the appearance of quinions in Italy at the end of the 13th century were oversize annotated legal codices that were produced in Bologna. 80% of these, inscribed in the 13th and 14th centuries, were composed of quinions. The production of large formats (in-folio) did not involve folding, and therefore there was nothing to prevent quinion quiring. The abundance of in-folio manuscripts in Italy led to the spread of quinion quiring, which became the standard composition.

[58] Supposedly, already at that time there were readymade quinions that began - according to the older tradition - with the hair side, and scribes who desired either smaller or larger quires would be able to either add or subtract the external bifolium and thus have the quire begin with the flesh side.

[59] MS St. Petersburg, Oriental Institute B 396, inscribed between 1276/7 and 1284/5.

[60] For another scribe who copied several parchment manuscripts using the standard quiring and a paper manuscript with different quiring, see my article, 'Towards a Comparative Typology of Italian Hebrew and Latin Codices', in *Libri, documenti, epigrafi medievali: Possibilità di studi comparativi – Atti del Convegno internazionale di studio dell'Associazione Italiana dei Paleografi e Diplomatisti, Bari (2–5 ottobre 2000)*, ed. F. Magistrale, C. Drago & P. Fioretti, Spoleto 2002, p. 383.

of the mixed quires was similarly variegated. The eight-bifolium, appearing in some third of the mixed-quire manuscripts in this corpus, prevails over the ten-bifolium composition (appearing in almost a quarter of them), or the senion or nine-bifolium compositions (each appearing in about one eighth of them).

The Sefardic zone (the Iberian Peninsula, Provence, North Africa, and Sicily)

Parchment manuscripts. The standard quiring in Sefardic parchment codices during all periods was by quaternions. Quaternion quiring was in use in 80 percent of these manuscripts, without noticeable variations in its incidence over time. Before 1275, all Sefardic dated parchment manuscripts were composed in this manner, apart a few that were produced in Toledo (see below). From that year onward, we find a limited proportion (15 percent) of senion quiring. Although the quinion composition was known in the Sefardic zone, its incidence there was extremely low: it shows in six parchment manuscripts only. Dated manuscripts produced in Toledo (and possibly elsewhere) until mid-thirteenth century, as well as some that were produced in the second half of the century, comprised the unusual quiring by ternions.

Quires were arranged by matching sides, each quire beginning with the hair side, with the exception of a few manuscripts from the fourteenth and fifteenth centuries in which quires begin with the flesh side.

Paper manuscripts and mixed paper and parchment manuscripts. As opposed to the comprehensive use of quaternion quiring and the limited use of the senions in parchment manuscripts, only four percent of paper manuscripts show quiring by quaternions, whereas senion quiring is the current composition which appears in almost half of them. Another composition, less prevalent yet comprised in a third of paper manuscripts or mixed paper and parchment manuscripts, was the eight-bifolium quire. The frequent incidence of this composition in mixed quires can be explained by the common practice of wrapping senions with an outer and inner parchment folio. Quinions are displayed in a mere seven percent of Sefardic paper manuscripts.

Byzantium

Parchment manuscripts. Despite the fact that Byzantine manuscripts were placed in-between the zones which favoured quinion quiring, namely - the Orient and Italy, the standard quiring in Byzantine parchment codices was by quaternions, arranged with matching sides and beginning with the hair side.

Paper manuscripts and mixed paper and parchment manuscripts. As was the case in other zones, there had been no standard quiring practice in Byzantine paper manuscripts nor in those with mixed paper and parchment quiring, but rather a variety of compositions, some of them prevalent more than others. As in Sefardic regions, which made intensive use of paper, so in Byzantine manuscripts - the preferred composition was senion quiring, present in almost half of the paper manuscripts. Eight-bifolia quiring was used in nearly one quarter of paper manuscripts and in more than one third of mixed-quire ones (cf. Sefardic zone above).

Tables 17-19: Distribution of quire composition by geo-cultural entities

On the basis for the statistical calculations in the tables below, see above in the introduction, the section on the 'General statistics of the database' (at the top of table 5). The following statistics are based on the corpus of dated codices until 1500, excluding fragmented ones, which quiring is manifest and uniform.

Table 17: Quire composition in parchment manuscripts

(1) ternions   (2) quaternions   (3) quinions   (4) senions   (5) 7 bifolia   (6) 8 bifolia

\# no. of manuscripts   % percentage in regional corpus

Zone	1		2		3		4		5		6		Total in corpus
	#	%	#	%	#	%	#	%	#	%	#	%	
Sefarad	6	3	145	80	6	3	25	14	0	0	0	0	**182**
Ashkenaz	1	0	240	93	1	0	11	4	0	0	1	0	**257**
Italy	1	0	58	13	384	84	9	2	1	0	1	0	**455**
Byzantium	0	0	22	88	1	4	2	8	0	0	0	0	**25**
Orient	0	0	3	23	10	77	0	0	0	0	0	0	**13**
Yemen	0	0	2	17	10	83	0	0	0	0	0	0	**12**
Unidentified	0	0	3	60	1	20	1	20	0	0	0	0	**5**
Total	8	1	473	50	413	44	48	5	1	0	2	0	**949**

Table 18: Quire composition in paper manuscripts

(1) quaternions   (2) quinions   (3) senions   (4) 7 bifolia
(5) 8 bifolia   (6) 9 bifolia   (7) 10 bifolia   (8) 11-14 bifolia

\# no. of manuscripts   % percentage in regional corpus

Zone	1		2		3		4		5		6		7		8		Total in corpus
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	
Sefarad	8	4	13	7	88	45	6	3	66	B	3	2	6	3	3	2	**194**
Ashkenaz	15	41	0	0	14	38	1	3	5	13	0	0	2	5	0	0	**37**
Italy	9	5	50	29	46	27	6	3	43	25	3	2	8	5	6	3	**172**
Byzantium	19	21	6	7	44	48	0	0	21	23	0	0	1	1	0	0	**91**
Orient	14	9	130	81	9	6	2	1	3	2	0	0	1	1	1	0	**160**
Yemen	2	3	72	92	3	4	0	0	0	0	0	0	0	0	0	0	**78**
Unidentified	0	0	1	14	2	29	1	14	2	29	0	0	1	14	0	0	**7**
Total	67	9	272	37	206	28	16	2	140	19	6	1	19	3	10	1	**739**

Table 19: Quire composition in mixed manuscripts

(1) quaternions   (2) quinions   (3) senions   (4) 7 bifolia
(5) 8 bifolia   (6) 9 bifolia   (7) 10 bifolia   (8) 11-14 bifolia

no. of manuscripts   % percentage in regional corpus

Zone	1		2		3		4		5		6		7		8		Total in corpus
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	#	
Sefarad	0	0	0	0	4	10	5	12	14	33	2	5	11	26	6	0	**42**
Ashkenaz	1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Italy	0	0	2	4	7	13	5	9	18	34	7	13	12	23	2	0	**53**
Byzantium	5	14	1	3	8	22	3	8	14	39	0	0	5	14	0	0	**36**
Orient	0	0	0	0	1	100	0	0	0	0	0	0	0	0	0	0	1
Yemen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Unidentified	0	0	1	50	0	0	0	0	0	0	0	0	1	50	0	0	**2**
Total	6	4	4	3	20	15	13	10	46	34	9	7	29	21	8	6	**135**

Binding

The binding of the manuscript quires was performed, naturally, following the completion of the copying. Our knowledge concerning the binding of Hebrew books in the Middle Ages is extremely limited, and even scantier are the facts known about the technology and craft of Hebrew bookbinding. Only few of the manuscripts were preserved in their original bindings or in renewed bindings deriving from an early period, and therefore no research concerned with the various technologies of bookbinding and their transformation in the geo-cultural zones of the Hebrew bookcraft has been advanced nor has there evolved a study of the art of decorative stamps on the leather coverings of the binding boards in Hebrew books. The well-developed research of manuscripts bindings of non-Hebrew books from the Christian and Islamic territories,[61] of which many have survived, and their typology, may be of service to the study of Hebrew manuscripts' bindings, for one could assume that the former were not bound differently from the Hebrew manuscripts, as evidenced by the remains of original bindings from both Occident and Orient. Moreover, literary sources and the few original bindings that have survived show that in Europe Hebrew books were given to Christian binders for binding and vice versa, Jewish binders bound books for Christian institutions, both clerical and secular.[62]

The term כרך (which designates volume in modern Hebrew) refers in the language of the Mishna and Talmud to scrolls, being derived from the root כר״ך which refers to 'rolling'.[63] Thus it appears in the *baraita* in B. Bava Batra 13b that discusses whether it is permissible to divide the holy scriptures: דתנן, ובכתבי הקודש אע״פ ששניהן רוצין לא

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[61] See, for instance, the illuminating studies in Maniaci & Munafò (eds.), *Book Materials and Techniques*, vol. 2, pp. 157-268. Especially useful is the Dutch glossary for binding terms and codicological terms related to binding (above, chapter 3, n. 29) due to the illustrations and equivalent German, French, and English terms included in it. For the development of ways for describing bindings and the related terminology, see recently *La reliure médiévale: Pour une description normalisée – Actes du colloque international (Paris, 22–24 mai 2003) organisé par l'Institut de recherche et d'histoire des textes (CNRS)*, ed. G. Lanoë, Turnhout 2008.

[62] For an exhaustive summary of this topic see *Encyclopaedia Judaica*, s.v. 'Books' by M. Ansbacher, Jerusalem 1971, vol. 2, cols. 1229–1233. See also S. Assaf, *Be'Oholei Ya'aqov*, Jerusalem, 1943, pp. 20-26 (in Hebrew), which is based chiefly on *Sefer Ḥasidim*. For literature on male and female bookbinders, see L.A. Mayer, *Bibliography of Jewish Art*, ed. O. Kurz, Jerusalem 1967, according to the entries 'bookbinding', 'bookbinders'. For the many 14th- and 15th-century published documents, chiefly from Aragon but also from Castile, which attest to the intensive engagement of Jews and conversos in bookbinding in archives, see the article by E. Gutwirth, 'On the History of reading: Hispano-Jewish Communities in the Age of Print', in *Studies in Jewish History Presented to Joseph Hacker*, ed. Y. Ben-Naeh, J. Cohen, M. Idel & Y. Kaplan, Jerusalem 2014, pp. 269-270 (in Hebrew).

[63] Compare the term תכריך that signifies a vertical scroll (above, chapter 1, n. 30).

.[64] יחלוקו ואמ׳ שמואל לא שנו אלא בכרך אחד אבל בשתי כריכות חולקין Like other terms in Hebrew, Greek, Latin, and Arabic, which originally referred to books in the form of scrolls, and subsequent to the evolution of the book-form were adopted in reference to the craft of codex making, so was the term כרך used to refer to the codex. However, among the Jews of Europe the action of binding was indicated by the verb קשׄר, i.e. tying together, which is well suited to the craft of sewing quires and tying them to the binding boards. We thus find in *Sefer Ḥasidim*,[65] the chief source of information about bookcraft in Germany at the turn of the twelfth and thirteenth centuries:

פעם אחת הוציאו צדיק מקברו וחלצו בגדיו והכוהו. בא לאחד בחלום ואמר לפי שהייתי רואה ספרים נמחקים ולא הייתי קושרם בטבלאות[66] לכך הוציאוני׳ (passage 911).

And elsewhere in the book, on handing over a book to a monk for binding:

אחד הלך לפני גלח לקשור ספרים <...> לא תקשור אפילו קונטריס אחד ולא תעזור לו לקשור׳ (passage 681); שני חסידים היו להם ספרים והוצרכו לקושרם והיה גלח בעיר שבקי לקשור ספרים יותר מן היהודים <...> אבל לקשור שאר ספרים <פרט לספר תורה>

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[64] MS Hamburg Cod. Hebr. 19 (Steinschneider Catalogue 165; according to the Sol and Henkind Talmud Text Databank at the Saul Lieberman Institute). The context and the ensuing talmudic discussion make it clear that the *baraita* is referring to a single scroll, and this is how Rashi too interpreted it in his commentary: בכרך אחד – כל ספריהן עשויין בגיליון <היינו מגילה> ואם יביאהו לב״ד לחלקו בזיון הוא, אבל שתי כריכות. On the other hand, the expression בכרך אחד in T. Bava Metsiʾa 2:8 (S. Lieberman (ed.). *The Tosefta according to Codex Vienna*, v. 5 [Neziqin], New York 1988, p. 70, passage 21) - מצא ספרים קורא בהן אחד לשלשים יום, לא יקרא בהן את הפרשה וישנה, ולא יקרא בהן את הפרשה ויתרגם, ולא יקראו שלשה בכרך אחד, ולא יפתח בספר יותר משלשה דפין <היינו טורי המגילה> and in the parallels in the Babylonian and Palestinian Talmuds, means 'at once', see S. Lieberman (*Tosefta ki-feshuta, 10: Seder Neziqin*, New York, 1988, p. 163-164).

[65] All the citations henceforth are from the Wistinetzky & Freimann, edition, unless otherwise indicated.

[66] The term טבלאות denoting a hard binding (made of wood), to which the quires were attached by threading through slats, was commonly used also in the numerous booklists from 15th century Italy. These booklists would frequently mention colourful leather coverings as well. In a booklist written in Lugo in 1493, the owner of a collection numbering 65 books mentioned boards covered in black leather (הטבלאו׳ מכוסה עור שחור) (with frequent mentions of the covering מכוסה עור [covered with leather], or just מכוסה [covered] in various colours, מכוסה ומכוסה עור, עם טבלאו׳ בנייר, and so on). See G. Vajda, 'Un inventaire de bibliothèque juive d'Italie', *REJ*, 126 (1967), pp. 473–475. Similar usages are found in a booklist from Cesena dated 1445, published by Sonne, e.g. א׳ ספר מעלות המדות עם טבלאות מכוסה עור אדום ומסמרים, see I. Sonne, 'Book Lists Through Three Centuries', *Studies in Bibliography and Booklore*, 2 (1955–1956), pp. 3–19 (the citation above is of no. 23). See also the booklists published by Rothschild, 'Listes des livres en Italie', pp. 300, 304, 314 (inter alia: ובטבלאות של נייר מדובק = boards of pasted paper, which may indicate that when unqualified טבלאות referred to wooden boards), 318 (קשור בלתי קשור and even בלתי טבלאות and also בטבלאות), 319, 322. In the booklist at the end of MS Jerusalem Yah. Ms. Heb. 3 (*Manuscrits médiévaux*, I, 75), inscribed in Italy before 1422 (published by S. Assaf, 'Reshimat sefarim mi-reshit ha-meʾa ha-15', *Kirjath Sefer*, 24 [1947-1948], pp. 248-249, (in Hebrew) the author of the list, Yaʿaqov ben Binyamin, took care to note in the entry of one of the manuscripts בלי טבלאו<ת> (with no boards).

בטבלאות שלומדים בהם אין אסור לתת להם לקשור, והיה עומד כדי שלא יקח השיורים

בספר פסול שלו (passage 682)

This source indicates that Jews themselves were bookbinders, and that even the strictest Ashkenazic Ḥasidim permitted books to be bound by monks, who were more expert at this craft. *Sefer Ḥasidim* prohibits the use of boards that had been cut off from Christian books, or of bifolia or folios from Latin or Greek codices for covering the boards of a Pentateuch (as is found in European libraries where numerous manuscripts and old printed books in Latin characters have exterior and interior bindings that are pasted over with parchment bifolia or folios taken from Hebrew manuscripts, as well as the thousands of notarial registers bound in soft binding made of Hebrew fragments, recently discovered in Italian archives)[67]:

אם ספרי גלחים שיש בהן תיפלה לע״ז[68] ונמחקו, לא יכתוב עליהן אפילו כתב איגרת. ואם יש טבלאות של ספרים פסולים אל יקשרם לספרי ישראל[69] (passage 1348); אל יכסה את ספרו בספרים הכתובים בלשון לעז או יווני. מעשה באחד שכסה חומש שלו בעור והיה כתוב בו לועזית של דברי הבאי, תגרות מלכי האומות, ובא צדיק וקרעו והסירו (passage 128 in the Bologna edition, 1538)[70].

Juxtaposing additional prohibitions which regard bookcraft, mentioned in *Sefer Ḥasidim,* and current practices evidenced in Hebrew manuscripts in Germany shows that these prohibitions arose from the high incidence of those practices.[71] *Sefer Ḥasidim* also mentions the book clasp of the type used in Europe:

ספר שאין אדם יכול לסגור עם המסגר לא ישים ברכו על הספר לדחוק הספר כדי לסגור הספר במסגר (passage 656).

As mentioned in chapter 2, section 1 (at the end of the discussion on vocalizers and masoretes, illustrators, proofreaders, and binders), one manuscript inscribed in a Sefardic script has survived from Lecce in southern Italy, the copying of which was completed on 27th of Ab 5245 (1485) and which includes a colophon by the binder from 2nd of Nissan <5>246 (1486) that also uses the verb 'to tie': קשרתי אני קרשקש קלונימוס

זה הסדור לבחור <...> < הש׳<ם> יזכהו. A similar usage is evidenced in an ownership note

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[67] See above, chapter 1, n. 57.

[68] Simcha Emanuel pointed out to me a similar expression in *Sefer Mitzvot Gadol*, Lavin, passage 45: גביעים שפגם הגוי ובטלן ואחר כך קנאם ישראל הרי זה אסור למוכרם לגוי לפי שהכומר יעשה בו תיפלה לעבודה זרה.

[69] The continuation of the passage implies that German Jews might have owned Latin translations of the Bible: אם יש כ״ד ספרים שכתבו גלח או כומר ולא הזכיר בו לא שום ע״ז ולא שום קדש, לא יצניעו עם ספרים

[70] This text is absent from the parallel passage (696) in MS Parma.

[71] See Beit-Arié, 'Ideals Versus Reality'.

at the end of MS Paris Hébreu 674, copied in Italy in the fourteenth century: ‏גם לי‏

‏שמואל <...> בה״ר שבתי <...> חלק <...> בזה הספר כי יגעתי <...> לקשור אילו הקונטרסים.‏

One of the first printers, Avraham ben Ḥayyim of Pesaro, who continued to print the *Arbaʿa Turim* which Avraham Conat had begun to print in Mantua, referred to himself in the colophon of the *Tur Yore Deʿa* (Ferrara 1478/1479 should be [1475/1476]) as ‏אברהם הקושר בן חיים‏, indicating that his previous trade had been a binder.[72] Notarial documents from Perugia (Umbria, Italy) from 1507-1511 attest to the existence of a bookbinding shop belonging to Shelomo ben Yo'av (di Dattilo) of Fabriano (in partnership with Ḥayyim of Perugia), who was a member of the bookbinders' guild and the owner of book and stationery stores in Perugia, in which he employed four young apprentices.[73]

The word ‏קשר‏ was used in a number of Italian booklists to describe a volume,[74] as was the word ‏חתיכה‏.[75] In the Middle East, Judaeo-Arabic booklists from the Geniza used the term ‏מגילד‏, a noun that meant in Arabic 'volume', and also an adjective meaning 'bound'.[76]

Box binding was one type of binding used in Hebrew manuscripts, apparently unique to Spain. It was first described by Leila Avrin in her discussion of four Sefardic manuscripts (one from Lisbon) from the last quarter of the fifteenth century.[77] However,

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[72] A photograph of the colophon page appears in A. Freimann (ed.), *Thesaurus Typographiae Hebraicae* (above, chapter 2, n. 248), 2, A5.

[73] See A. Toaff, Il vino e la carne: Una comunità ebraica nel Medioevo, Bologna 1989, p. 258, note 29. Nurit Pasternak referred me to this source.

[74] Already in the 12th-century booklist found at the head of MS London Add. 27169 (see its copying, in the appendix to this chapter, n. 52 in the Hebrew version of *Hebrew Codicology*), and in the one recorded at the head of MS Bologna, BU Ms. 3574b.

[75] See for instance Rothschild, 'Listes des livres en Italie', p. 305, no, 78 (‏בבי חתיכות‏). For this term see N. Allony, 'Ḥatikha, ḥatikhot', *Lešhonenu La-ʿam*, 135-136 (1962/3), pp. 88-91 (in Hebrew). The term ‏חתך‏ to denote a volume appears in an Italian book inventory from Imola from 1384/5 (Bonfil, 'List of Hebrew Books', p. 60, no.7). The term ‏כובס‏ (in plural ‏כובסין‏), which appears in a list of incunabula and manuscripts from Spain or Portugal close to the time of expulsion (see S.M. Iakerson, 'An unknown list of Hebrew books', *Manuscripta Orientalia*, 4, no. 1, March 1998. p. 18) where the expression ‏בלי קשירה‏ also appears) is presumably a phonetic spelling of the term ‏קובץ‏.

[76] See Allony, *Jewish Library*, according to the index. It appears that its main usage there is in the sense of a volume. On a professional binder from Al-Maḥalla, see Goitein, *Mediterranean Society*, vol. 2, p. 239.

[77] L. Avrin, 'The Sephardi Box Binding', in *Library Archives and Information Studies*, ed. D. Schidorsky (Scripta Hierosolymitana 29), Jerusalem 1989, pp. 27–42. The most famous of these is the Kennicott Bible kept in the Bodleian Library in Oxford, MS. Kennicott 1 (a Bible and *Sefer ha-mikhlol* by David Kimḥi, inscribed in La Coruña in 1476 by Moshe ben Yaʿaqov ibn Zabara for Yitsḥaq ben Shelomo de Braga and which was decorated and illuminated by Yosef ibn Ḥayyim). The decorative box binding was accompanied by a splendid satchel that contained the volume (designated as MS. Kennicott 1*). See B.

in the meantime, several other box-binded manuscripts have been discovered, some of which were produced in Yemen.[78] This type of binding was also found in Arabic manuscripts and was used in the binding of Qur'ans in Kairouan during the ninth century.[79]

Bindings with artistic covers were created by a special technique of embossed leather by the scribe Meir ben Isra'el Yaffe of Heidelberg during the second half of the fifteenth century.[80] In 1468 he bound an old Ashkenazic Pentateuch (MS Munich Cod. Hebr. 212), on which front binding plate he embossed the inscription החומש להעיצה מנורנבערקאי שיחי מאיר יפה המצייר.[81] And indeed, in the protocols of Nuremberg city council from 1468 a clause was recorded permitting the Jew

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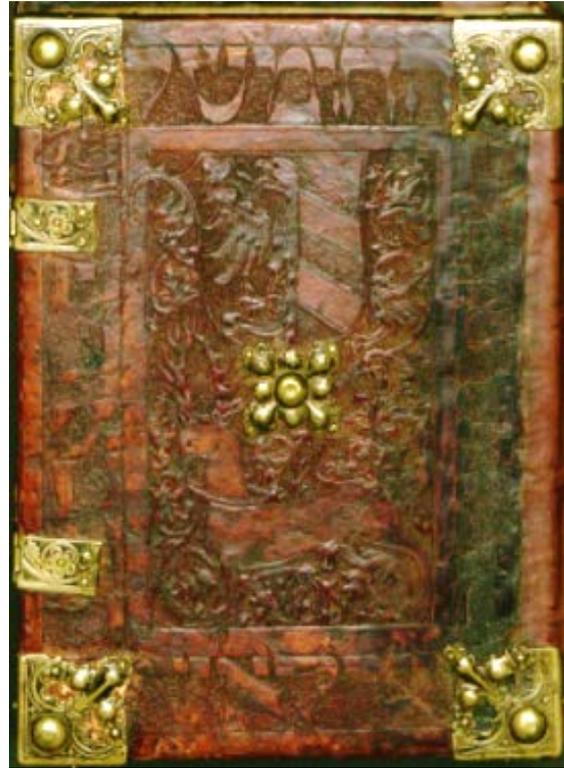
Narkiss & A. Cohen-Mushlin, *The Kennicott Bible: An Introduction*, London 1985, pp. 84-89. Another manuscript encased in a box binding is MS Schocken 24360 containing a Pentateuch, *Haftarot*, and the Five Scrolls (offered for auction at Christie's on November 15, 2005 in New York, see *Important Hebrew Manuscripts from the Salman Schocken Collection* [Auction Catalogue], New York 2005, Lot 13.

[78] The last of these is a Pentateuch inscribed in San'a in 1498, apparently by the scribe David ben Benaya ben Sa'adia (kept until recently in Westminster College in Cambridge and sold on auction on 29th June, 2007 at Sotheby's auction house, see *Western Manuscripts and Miniatures* [Auction Catalogue], London 2007, Sale no. LO7240. Another manuscript in box binding was also inscribed in San´a in 1481 by Yosef ben Benaya ben Sa'adia (MS London, David Sofer Collection 6, formerly MS Montreal, Judah Elberg Collection 282). I am grateful to Angelo Piatelli for drawing my attention to this manuscript.

[79] See Sirat, *Papyrus*, pp. 77-78, according to G. Marçais & L. Poinssot, *Objects kairouanais, ixe au xiiie siècle: Reliure, verreries, cuivre et bronze, bijoux*, Tunis 1948, p. 14, and especially Déroche, *Islamic Codicology*, pp. 282-283.

[80] He was the copyist of the undated Cincinnati Haggada, MS Cincinnati, HUC 444, as well as of the London Haggada, MS London, Add. 14762 (illuminated by the scribe-illuminator Yo'el ben Shim'on, aided by Christian artists), as identified by Mordecai Glatzer (see M. Glatzer, 'The Ashkenazic and Italian Haggadah and the Haggadot of Yo'el ben Shim'on', in *The Washington Haggadah: A Facsimile Edition of an Illuminated Fifteenth-Century Hebrew Manuscript at the Library of Congress Signed by Yoel ben Shim'on – Commentary volume*, ed. M.M. Weinstein, Washington 1991, pp. 139–144). In addition, he was identified as the scribe of MS New York MS 4057 (a maḥzor in the Ashkenazic rite, which, according to the name noted in the poem for the *ḥatan tora* on fol. 321v, was copied for the owner of the above mentioned London manuscript) and of MS Hamburg Cod. Hebr. 243 (a prayer book according to the Ashkenazic rite, in which the name Meir was highlighted), as observed by Yael Zirlin.

[81] An image of this binding appears also in *Encyclopaedia Judaica*, Jerusalem 1971, vol. 2, col. 1228.

Meirlin of Ulm to stay in the city in order to bind a number of books for the council. Art historians have attributed to Meir ben Isra'el Jaffe more bindings similar in style to the binding of MS Munich.[82]

[82] For the bibliography on the Munich bindings and similar bindings see Mayer, *Bibliography of Jewish Art* (above, n. 62) according to the index entry 'Yaffe', and more recently: E. Katzenstein, 'Mair Jaffe and Bookbinding Research', *Studies in Bibliography and Booklore*, 14 (1982), pp. 17–28; idem & W.D. Cohn, *A origem do livro*, São Paulo 1986, pp. 356–386.

Appendix: קונטרס or קוטרס - the distribution and spelling of a quire term in Hebrew and its codicological meanings

The literary sources indicate a spatial distribution of the form of the loanword borrowed into Hebrew in order to denote the basic building block of the codex. In the West the form was קונטרס, in the Orient and in Byzantium קוטרס. Ostensibly, a trivial difference, which can be attributed by phonetical shifts, but its consistency both in the Occident and in the Orient demonstrates that two different linguistic traditions and etymological sources are in question. What's more astonishing is that the apparent etymological meaning of the form in the Oriental and Byzantine quire terms contradicts the codicological reality in the Oriental zones, just as is the case in Ashkenaz and the European lands in general but in a converse manner. Just as the European form קונטרס (*quntras*) reflects the term quinternus, a five- bifolium quire in medieval Latin, thus the form קוטרס (*qutras*) apparently reflects the codicological term quaternus, a four-bifolium quire in the medieval Latin. And just as in Germany and in France the quaternion (four bifolia) quire was commonly used in the extant Hebrew codices in these regions, the standard quiring of the Hebrew and Arabic manuscripts in the Oriental zones was the quinion, unlike the practice apparently reflected in the terminology used in the Oriental sources.

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For the complete Appendix and the many Hebrew sources see the Appendix in the Hebrew version of Hebrew Codicology.

Chapter 5: Marking the sequence of quires, bifolia, or folios in the codex

Unrevised version

The codex is build up from a series of quires constructed from multiple folded bifolia. Such a complex construction requires a means of ensuring the correct order of the quires and of the bifolia, and of marking their sequence after copying, and all the more so during the copying process. This was required also in those Latin manuscripts, which were copied, so it seems, on parchment or paper sheets that were folded after being inscribed to form the bifolia of a quire; for only subsequent to the copying and during the binding process were the folds connecting their bifolia (or folios) cut at the upper, outer, and lower margins, and at any rate, copying by the method of imposition[1] would not have guaranteed the correct order of the quires. Even the temporary stitching of quires for the purpose of copying[2] did not relieve the copyists from the need to ensure the correct sequence of the codex's quires before binding, as well as the correct internal order of a quire's bifolia upon its rebinding. And yet, the temporary stitching and its eventual disappearance may explain the development of the means for ensuring the order, which began with the marking of a sequence of quires only, to which was later added the marking of the bifolia's sequences within the quire and even of folios, as Peter Gumbert has proposed. The means for ensuring the order of the codex that were in practice in Hebrew manuscripts, their frequency, and location in the quire may provide an indication of the methods of construction of the quires and of the copying units. Were quires indeed constructed by folding sheets that had been inscribed by the copyist prior to folding them to produce bifolia (with such manuscripts therefore only containing a means for ensuring the order of quires), or were separate bifolia prepared initially, later to be copied in their folios correct order in the quire (with such manuscripts therefore featuring a means for ensuring the order of bifolia)? This question has not been sufficiently researched in Hebrew codicology, but the

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[1] See above, chapter 4, the text referenced by note 1 and in the note.

[2] As already assumed by Gregory in the late 19th century; Gullick discovered such stitching in 12th century English and French manuscripts (and Gumbert expanded the provenance of its findings in the Occident and Orient as well as the period of its use). See ibid., n. 14.

preponderance of odd quire constructions makes it difficult to accept this possibility (See also discussion above in chapter 4).

Recently a new highly detailed system of notation has been proposed (with a full suite of lettered symbols, numbers, and abbreviations) for formalising the description of the methods of ensuring the order of the codex and of its components in Occidental manuscripts.[3] The various types of methods used in Hebrew manuscripts will be presented below, and described in verbal terms.[4]

The means employed by Jewish copyists to ensure the correct binding of the codex can be classified into two main groups: methods based on a catchwords deriving from the copied text,[5] (see in greater detail below in section 1), and methods based on numbering added to the text at its material divisions (more on which see below in section 2). Both methods were implemented at the codicological dividing points of the book's structure – initially only at the transition from one quire to the next, and eventually also in transitions between bifolia and even between the manuscript's folios, although these are not independent codicological units. In all zones both methods were used, usually simultaneously in the same manuscript, but in Ashkenaz the numbering methods were extremely rare, and even in Byzantium they were scarcely used. Generally, the methods used to ensure the order of the codex in paper manuscripts were different from those used in parchment manuscripts, except in the Middle East, where paper replaced parchment as the standard writing material already in the beginning of the eleventh century. In the other zones, where paper spread only much later, paper was presumably seen as more vulnerable than parchment and its folios more likely to be separated from their pairings and to become detached from their quires, and therefore copyists were not content only to preserve the order of the quires, like most copyists of parchment

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[3] P. Andrist, 'Formule de description des signatures, réclames et autres marques de cahiers dans les catalogues de manuscrits anciens', *Gazette du livre médiéval*, 44 (2004), pp. 25–38. For a categorized description of methods for ensuring the order of the codex in Humanist parchment manuscripts, including a description of the precise location of the markings used for this purpose, see Derolez, *Codicologie*, vol. 1, pp. 40-64.

[4] Cf. M. Beit-Arié, 'Les procédés qui garantissent l'ordre des cahiers, des bifeuillets et des feuillets dans les codices hébreux' in Hoffmann (ed), *Codicologie comparée*, pp. 137-141.

[5] An unusual method of using graphic markings instead of catchwords was employed in an undated 15th century manuscript in an Ashkenazic script (MS New York L873). A number of forms were marked at the bottom of each verso page and were repeated on the following recto pages.

manuscripts, but added means to ensure the order of bifolia or folios.[6] It can be hence inferred that these means spread in those areas in later periods.

Acquaintance with these methods has clear typological but also chronological value. The prevalence of each type may help us date a manuscript and to some degree also identify its provenance. What's more: understanding these methods provides a vital key to uncovering the structure of the quires when it is not visible, especially in paper manuscripts, and to reconstructing the folios, the bifolia, and even the missing quires of a codex.

Latin codicology attests that the numbering method predates the catchword method, which began to be used in the ninth century,[7] and the study of early Geek codices reveals that the numbering method had appeared already in the early era of the Greek (and Latin) codex,[8] while the catchword method appears regularly on Greek manuscripts only in the period of the Byzantine Renaissance.[9] In all of the early Hebrew dated

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[6] This explanation for the proliferation of means of ensuring the order of bifolia in the more vulnerable paper codices can be contested: without temporary stitches the order of parchment bifolium copyings could be also easily disrupted during the copying process.

The development of means for ensuring the order of the codex, until they came to be implemented on every single folio – even on every single page – was presumably not only precipitated by the transition to writing on paper but was also (and perhaps primarily) due to the relatively late development of indexing and inscription of a table of contents in Hebrew books, and naturally these required a precise marking of text locations. Probably the earliest evidence for the inscription of a table of contents appears in the prologue of Rabbi Eliezer ben Natan (one of the early Tosaphists from Germany, deceased 1170) to his work *Even ha'ezer*: ‏אקרא לספר הזה אבן העזר <...> ואוגדה בראש הספר ראשי האמירות למען ירוץ הקורא‏ ‏בו וימצא חיש מהר את אשר יחפש ויצטרך לפי השעה‏ (Simcha Emanuel, personal communication). Another important reference is the hierarchical detailing of the names of the chapters (*halakhot*) in each book of Maimonides' *Mishne Tora*.

[7] J. Vezin, 'Observation sur l'emploi des réclames dans les manuscrits latins', Bibliothèque de l'Ecole des Chartes, 125 (1967), pp. 5–33; idem, 'Codicologie comparée', in *La paléographie hébraique médiévale*, Paris, 11–13 septembre 1972, ed. J. Glénisson & C. Sirat (Colloques internationaux du CNRS 547), Paris 1974, pp. 153–157. Vezin mentions a number of isolated manuscripts that predate 800 which include catchwords, noting that catchwords appear for the first time in Spain and in France in the 10th century and in Italy in the middle of the 11th century.

[8] The numbering of quires and other numberings were integrated already at the inital spread of the Greek and Latin codex. According to Turner (*Early Codex*, p. 77) the earliest known numbering of quires is from the Bodmar II papyrus, from the first half of the 3rd century (where foliation was also added by the copyist). Saenger, (*Space Between Words*, pp. 77-82), concentrated Turner's and others' data on the numbering of folios and pages in Greek and Latin codices and scrolls, and concluded that systematic foliation appears in Latin manuscripts only after 1200 (see below on the distribution of foliation in Hebrew manuscripts).

[9] J. Irigoin, 'Typologie et description codicologique des manuscrits de papier' (above, ch.3, note 133), pp. 297–298. Prior to this, quire catchwords appeared sporadically in the 13th century. During the middle ages catchwords were not used in Syriac codices, but they include quire numbering since the 6th century.

known manuscripts which were manufactured in the tenth century, there are no means for ensuring the order of the quires.[10] The first dated manuscript in which such means survive is from the beginning of the eleventh century, where the two methods coexist.[11] However, one should consider the fact that both methods for ensuring the continuity of the text across its material divisions were known to Hebrew scribes from antiquity. The use of catchwords for connecting scrolls in the early phases of the composition of biblical books is proven by the first two and a half verses from the beginning of the Book of Ezra and Nehemiah, which are doubled in the Masoretic version at the end of the Book of Chronicles; it is not the case, as was commonly thought since Zunz's time, that the last two and a half verses of Chronicles were doubled at the head of the Book

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See F. Briquel-Chatonnet, 'Cahiers et signatures dans les manuscrits syriaques' (above ch.4, note 20). The data on Syriac manuscripts are derived chiefly from the collections in the Bibliothèque Nationale de France in Paris and the British Library in London.

[10] A few fragments of quire numbers (signatures) at the head of a quire have been found in the earliest dated Hebrew codex, produced in 894/5 (see *Codices hebraicis*, Part I, Manuscrit 1). However, doubts regarding the reliability of its dating have been confirmed by Carbon 14 testing which has indeed established that the manuscript was produced around one hundred years later (see ibid.), in other words, in a period when means for ensuring the order of the codex began to be used. One cannot entirely rule out the possibility that the means for ensuring the sequence of the quires inscribed at the upper or lower margins, as we shall see below, were cut out during repeated rebinding, but their absence from all the dated codices from the 10th century, even the well preserved ones, casts doubt on this possibility. The very fact that all the remains of dated books from the 10th century are biblical books may indicate that this absence stems from the scribes' reluctance, during the early era of the Hebrew codex, to add anything to the biblical text. Indeed, quires in Arabic Qur'ans from the early period were never numbered! See M.-G. Guesdon, 'Les réclames dans les manuscrits arabes datés antérieurs à 1450', in Déroche & Richard (eds.), *Scribes et manuscrits du Moyen-Orient*, pp. 66-75 ; idem, 'Systems to Indicate the Order of Folios', subchapter in Déroche, *Islamic Codicology*, p. 91 ; and also idem, 'La numération des cahiers et la foliotation dans les manuscrits arabes datés jusqua'à 1450', in *La tradition manuscrite en écriture arabe*, ed. G. Humbert (*Revue des Mondes Musulmans et de la Méditerranée*, 99–100 [2002]), pp. 101–115. In a personal communication François Déroche informed me that Qur'anic quires were not numbered by signatures before the 15th century.

[11] MS St. Petersburg Евр.-Араб. I 4520, copied in Fusṭāṭ in 1006 (*Codices hebraicis*, Part I, Manuscrit 16), is the earliest extant dated paper codex, albeit a damaged one, which is not a small fragment. It should be noted that quire catchwords were found in the biblical manuscript inscribed in Kairouan (Tunisia) and likely to have been written in the 10th century – its damaged date does not disclose its year of production but it was clearly between 941 and 1039 (see *Codices hebraicis*, Part II, Manuscrit 29). The first occurrence of catchwords in a parchment biblical codex was in the earliest codex containing the whole Bible, copied in Cairo in 1008 (ibid., Part I, ms. 17). Since then, quire catchwords or numbering (or both) are present in all Oriental manuscripts that are not fragmentary – biblical on parchment and non-biblical on paper. Catchwords or quire numbering appear in the earliest manuscripts produced in Italy (ibid., Part II, ms. 38 of 1072/3; ibid., Part III, ms. 43 of 1090/1; ms. 48 of 1105/6); catchwords are employed in all the earliest dated manuscripts that survived from the Ashkenazic zones from the last quarter of the 12th century (ibid., Part IV, mss. 79,84, 85, 91), and quire numbering is found in the earliest dated codex from Christian Spain of 1184 (ibid., Part I, ms. 81). Thus the earliest manuscripts produced outside the Middle East had been employing means for preserving the right sequence of the quires. In many of them both catchwords and numbering are employed.

of Ezra and Nehemiah. Menahem Haran, who agrees with the reigning view that the two books – Chronicles and the Book of Ezra and Nehemiah – were once a single textual unit, believes that it was the substantial length of Chronicles that prevented it from being copied to its full extent in one continuous scroll and therefore the part consisting of the Book of Ezra was written on a separate scroll, and the catchwords were written at the end of Chronicles.[12] The use of sheet numbering in scrolls is clearly evidenced in the remnant of numbers in fragments of one of the Dead Sea Scrolls.[13] Means for ensuring the order of quires have been found in non-biblical manuscripts, which although undated may have been written before the eleventh century, because their antiquity is indicated in the script, in their material and scribal traits, and also in the configuration of the text.[14]

The corpus of dated manuscripts written before 1500 and documented by the Hebrew Palaeography Project, in which means of ensuring the correct order of the codex have survived, serves as the basis for the ensuing discussion about the classification of these means. The various data cited in the discussion are derived from this corpus, unless otherwise noted. Sometimes findings are cited also from undated manuscripts.

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[12] See M. Haran, 'Catch-Lines in Ancient Palaeography and in the Biblical Canon', *Eretz-Israel: Archaeological, Historical and Geographical Studies*, 18 (Nahman Avigad Volume), pp. 124-129 and esp. 126-127 (in Hebrew), and cf. ibid. also references to the literature on catch-lines in clay tablets from Mesopotamia. But also see S. Japhet's study 'Ha'im ḥibber ba'al divrei-hayamim et sefer Ezra-Nehemia?' (M.A. Thesis, Hebrew University of Jerusalem, 1965), which confirms the view, based on linguistic and ideological criteria, that the two works were not authored by the same person. It is immaterial whether the two books were authored by a single author or not, because the use of a catch-line testifies to the literary connection between the works. For a discussion of the length of biblical books and the limitations of including their full extent on the papyrus scrolls that predated parchments scrolls, as well as the changes that ensued from including them on *gevil* scrolls, see the articles by Menaham Haran: 'The Size of Books in the Bible and the Division of the Pentateuch and the Deuteronomistic Work', *Tarbiz* (1984), pp. 329-352 (in Hebrew); 'Torah and Bible Scrolls in the First Centuries of the Christian Era', *Shnaton: An Annual for Biblical and Ancient Near Eastern Studies*, 10 (1990), pp. 93-106 (in Hebrew); 'On Archives, Libraries and the Order of the Biblical Books' in *The Bible in the Light of its Interpreters (Sarah Kamin Memorial Volume)*, ed. S. Japhet, Jerusalem 1994, pp. 223-224 (in Hebrew).

[13] J.T. Milik, 'Numération des feuilles des rouleaux dans le scriptorium de Qumrân', *Semitica*, 27 (1977), pp. 75–81, Pls. X–XI. On the number of sheets of the first nine sheets of an Italian Tora scroll written in 1091/2 (whose scribe also added sheet catchwords at the end of all the sheets), see below, chapter 7, n. 31.

[14] E.g. the manuscripts of the *Sifra* in Babylonian vocalization kept in the Vatican Library (Vat. ebr. 66) or the manuscript of *Bereshit Raba* in the same collection (Vat. ebr. 30) – both use quire catchwords.

1. Catchwords and counter-catchwords

Catchword methods fall into two types – the main and more ancient method, and its subtypes will be called in brief the catchword method[15] (quire, sheet, and bifolium catchwords), and the secondary method, which is merely a variation of the catchword method will be called the counter-catchword method. Both methods are based on the repetition of a word or several words from the copied text in the transition from quire to quire or from bifolium to bifolium or from folio to folio, without adding anything to the text to mark the sequence of the quires, or bifolia, or folios.

Catchword in an Oriental manuscript from the mid-fourteenth century
MS Vatican Vat. ebr. 497

In the catchword method, the first word(s) of a quire, a bifolium, or a folio, is written in the lower margin of the end of the preceding quire/bifolium/folio, usually next to the vertical margin that forms the left boundary of the written area.

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[15] The Hebrew term שומרים was coined after the Latin *custodes*. In English – catchwords; in French – réclames, in Italian – richiami; in Arabic taʿaqib (from the root meaning 'to follow', a term that suits Hebrew as well). See the study by Muhammad Jamil, 'Islamic Wirāqah' (above, chapter 3, n. 58), p. 33, and cf. Gacek, *Vademecum*, p. 51, which also cites other terms. Suzanna Wijsman has pointed out to me that musical notes written in the Middle Ages, since the 11th century, used a form of catchline at the end of lines – notes anticipating the following notes (*custos* in Latin), which were meant to facilitate the fluid reading of notes.

The quire catchword – a preview of the continuation of the copied text in the following quire – provides an outstanding means for ensuring the correct order of quires by employing the text itself to concatenate its sequential parts. As it is inscribed outside the page's written area it also clearly marks the end of the quire.

Already at the beginning of the twelfth century the use of the secondary catchword method emerged – counter-catchwords. This method also uses the repeating of words from the copied text at the transition from one quire, bifolium, or folio to the next. However, the catchword stratagem involved writing the first word(s) of the quire at the bottom of the last page of the preceding quire, while the counter-catchword stratagem involved the repeating of the last word of a quire at the beginning of the first line of the following quire (or bifolium or folio). This method, which never became popular, (although eventually it became widespread as a substitute for bifolium and folio catchwords) presumably sought to avoid adding anything to the copied text but also wished to camouflage the means of ensuring the sequence of the quires (and eventually of bifolia and folios) and assimilate it into the written space. This assimilation seems to have presented difficulties for the reader, who was liable not to fathom the reason for doubling the word, and this uncommon method might have been a stumbling block for copyists who were not familiar with it, causing various types of dittography's while copying from models that used such practice,

The various types of catchword method were the main methods in use in all zones except for the Middle East, where the signature method was preferred during the early centuries of codex production. Because copyists tended to use both catchword systems described above in many manuscripts, the overall distribution of their use comprehended almost all of the manuscripts in the corpus under discussion (88 percent) – the quire and bifolium catchwords exist in 60 percent of them, folio catchwords exist in almost half of them, and only 14 percent of them contain the counter-catchword variation. A third of the manuscripts in which folio catchwords were marked at the end of quires also (identifiable as such according to the characteristic placement and shape of folio catchwords) did not contain quire catchwords. Sometimes, in order to ensure the sequence of folios, the copyists mixed both methods − catchwords and counter-catchwords.

A. Catchwords

Catchwords were written at the foot of the page, and therefore many and sometimes all were lost when the margins of the page were trimmed when a manuscript whose binding had become worn over was rebound. Usually the catchword was written horizontally near the left margin vertical ruling line, almost always in the same script and size of the body text. In the Orient, from the end of the twelfth century[16], the custom of writing catchwords diagonally became widespread, as part of many copyists' tendency to write the final words of a line that were expected to exceed the margin in this manner (see below, chapter 7, line management). This custom appears in almost two thirds of the dated Oriental manuscripts with catchwords of all types (in Yemen it is less frequent), and it was undoubtedly influenced by the line management of Arabic manuscripts and its tradition of applying means for ensuring the sequence of codices.

Sometimes quire or folio catchwords were written in the middle of the bottom margin. The earliest extant instance of a quire catchword in this position is in an Ashkenazic manuscript, apparently from France, produced in 1215/6,[17] but it was preceded by manuscripts in which the catchwords were written in the lower margin close to the middle or in the middle of the second column, in manuscripts that were copied in two columns. This location of the catchword is also evidenced in later periods. Catchwords that were written in the middle of the margins were not characteristic of any particular region, their distribution was limited, and in the Middle East they are not evidenced at all. In a few dozen manuscripts quire catchwords were written vertically, and in a small number of manuscripts folio catchwords were written in this manner. The only region in which this form was relatively prevalent is Ashkenaz (German lands and France) where it appears in 15 percent of the manuscripts written there that include quire catchwords.[18] Not long after the use of catchwords began in the Orient in the eleventh century, they began to be decorated, usually simply, in order to make them stand out[19] (quire numbering was similarly decorated), but sometimes the catchwords were ornamented with more complex designs.[20] In Europe, especially in the Ashkenazic zone

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[16] The earliest manuscript with diagonal catchwords is from 1190 (*Codices hebraicis*, Part IV, Manuscrit 86).

[17] MS London Ar. Or. (Margoliouth Catalogue 68).

[18] This calculation includes the practice of copyists who assisted a senior copyist. For vertical catchwords in Latin and Greek manuscripts see Vezin's article, 'Codicologie comparée' (above, n. 7).

[19] E.g. *Codices hebraicis*, Part II, Manuscrit 22.

[20] Ibid., mss 29 (by one of the scribes), 33, 38.

and slightly more so in Byzantium, quire catchwords (usually only some of them) were occasionally decorated by the copyist with pen drawings and sometimes with Masora micrography rendered by the Masorete-vocalizer. In Germany and France, where 15 percent of manuscripts containing decorated quire catchwords, the quality of the drawings – particularly those of fauna – was generally skilled. In Byzantium, in which the rate of such manuscripts is 13 percent,[21] the drawings of fowl are much more unschooled, and they resemble the drawings of fowl in non-Hebrew Byzantine manuscripts from the provinces.

When a catchword was inscribed at the end of each folio, some of the copyists introduced a change in form to the catchword written on the final page of the quire, either by varying its location, decorating it differently or using a different type of script. Such catchwords should be regarding as quire catchwords.

A1. Quire catchwords

A quire catchword is a word written in the margins at the bottom of the final page of the quire, repeating the first word of the next quire.

This was the ordinary device in parchment manuscripts, whereas paper (or mixed-quire) manuscripts utilized bifolium or folio catchwords as well. Quire catchwords were less

Illuminated quire catchword
MS Jerusalem Heb. 8° 1876, fol. 199v
<Florence> 1477/8

Catchword in the middle of the lower margin
MS Milan, G2 sup. Fol. 216c <France> 1286/7

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[21] The cited rates do not include manuscripts in which the sequence of the text is protected by foliation and in whose quires the final folio catchword was not written in a different fashion.

used in the Orient, especially in the eleventh and twelfth centuries, and scribes preferred at that period quire signatures. However this finding may be distorted because of the great number of fragmented manuscripts. In Franco-German areas, apart from a few exceptions, quire catchwords were the only system for ensuring the quire order, and they appear in more than half of the few paper manuscripts.[22]
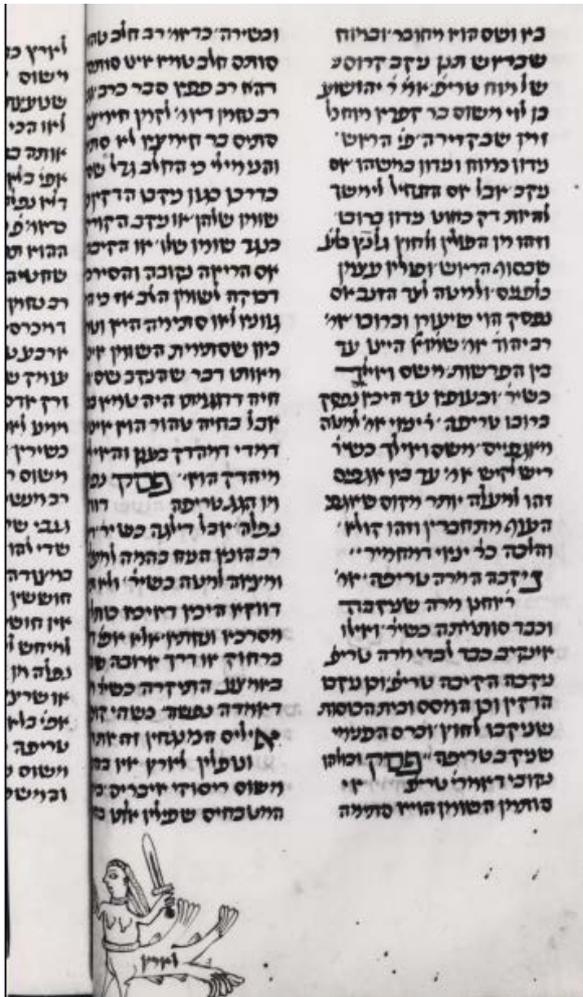
Illustrated quire catchword. <Ashkenaz> 1253
MS London Harley 5849, fol. 13v

Quire catchword with adjacent drawing. Tallard (France) 1304
MS Parma Parm. 3006, fol 199v

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[22] Catchwords inscribed also in the middle of the quire (at the end of the first half of the quire, on the right hand page of the central opening), perhaps to indicate to the binder which was the central opening to be stitched (like the marking of the opening in Oriental manuscripts, see below) were added in three manuscripts written in several areas: MS St. Peterburg Евр. I 484, written in Byzantium in 1348; MS St. Peterburg, Евр. I 1345 copied in the Middle East in 1397; MS Prague NL XXIX 53 (formerly MS Breslau Seminar , Loewinger & Weinryb Catalogue 14; recently the manuscript has been transferred – along with the other manuscripts deriving from this collection – to the Jewish community in Wrocław and deposited in the University library there), which was written in 1477 in Cingoli, central Italy). This phenomenon is also known from a few Arabic manuscripts. See Guesdon, 'Les réclames dans les manuscrits arabes' (above, n.10), p. 69, where she mentions another rare system – a folio catchword on the first and last pages of a quire.

Catchword illustrated by Masoretic micrography. <France> 1239
MS Vatican Vat. ebr.14, fol 24v

A2. Bifolium catchwords

The quire catchword method was meant to ensure the correct sequence of the units that make up the codex – the quires. The purpose of the bifolium catchword method was to ensure the right order of the quire's building blocks – the bifolia. This method entailed writing the catchwords at the end of the first verso page of each bifolium, i.e. on the verso page of the first half of the quire. It was sufficient, of course, to concatenate these folios in order to ensure also the order of the folios of the second half of the quire which were attached to each other as bifolia.

This method was presumably meant to ensure the correct order of copying when it was carried out on separate unstitched bifolia, rather than to ensure the order of the codex after it was written. In most manuscripts, folio catchwords and bifolium catchwords began to be used at around the same time period. However, folio catchwords did appear even earlier in a few manuscripts, although this method is less economical than the bifolium catchword method and seems to include superfluous markings. Despite the earliest use of bifolium catchwords in a mixed quire manuscript from 1225 in Spain,[23] it appeared in all other areas only in the fourteenth century, and especially in the latter

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[23] MS Jerusalem Yah Ms. Heb. 1 (*Manuscrits médiévaux* I, 2), which is the earliest dated manuscript with bifolium catchwords.

end of that century.[24] Yet, astonishingly, the distribution of this detailed and yet economical marking was limited in comparison with the distribution of the folio catchword method. It was implemented in only 4 percent of all the manuscripts in the corpus of dated manuscripts, written from 1225-1500, while the proportion of manuscripts in which catchwords appear on all folios of the quire is about 40 percent, i.e. ten time more frequently. Although the writing of catchwords in the second half of the quire (except for the final one) was not necessary, it was apparently more ergonometric, because it relieved the copyist of the need to remember to stop writing catchwords after reaching the middle opening of the quire. The same applies to the catchword appearing at the end of the final folio of the first half of the quire, i.e. the verso page of the mid-quire opening, which was written in most manuscripts with bifolium catchwords although it is superfluous, and in fact is not a bifolium catchword at all, but rather a folio catchword between the pair of folios of the centre bifolium. Indeed, to ensure the order of the quire's bifolia, it would have been sufficient to inscribe catchwords in its first half, minus the centre bifolium, as was practiced by about a fifth of the copyists who adopted this particular method.[25]

A3. Folio catchwords

The practice of writing a catchword on every folio (on its verso side) of a codex was the most widespread means of ensuring its order, and it was used in the late paper manuscripts in all the zones of Hebrew book production. It makes sense that this practice emerged in the Orient where most of the manuscripts written from the eleventh century onward were made of paper and were more fragile, with their bindings being prone to fall apart and the folios separating. Indeed, the scribes of the Oriental parchment manuscripts and in Yemen even in late periods, only employed methods for ensuring the order of quires. However, it is not unlikely that the reason this method of individual markings became widespread was that it facilitated the more convenient

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[24] For the first time in the Orient in 1313, in Byzantium in 1384, in Ashkenaz in 1386, in Italy in 1397 (by a Sefardic copyist, and by an Italian copyist – in 1416).

[25] In her article 'Les réclames dans les manuscrits arabes' ([above, n. 10], p. 69), Guesdon also noticed that the catchword was left out of the middle opening of the quire in some Arabic manuscripts. In MS Vatican Urb. ebr. 41, written, apparently in Bologna, in 1422, the Sefardic (or Provençal) copyist wrote the bifolium catchwords in the second half of the quire (and also at its opening). In MS Oxford MS. Opp. 676 (Neubauer Catalogue 1158), written in Ashkenaz around the first quarter of the 15th century, the catchwords only contain the first letter of the first word of the following bifolium, in the same manner that bifolium catchwords are written in an Oriental manuscript copied perhaps during the 13th century (MS St. Petersburg Евр. II A32/1).

practice of copying on unstitched bifolia, as the sequence of the copying required the scribe to switch from one bifolium to another and then to return to the previous bifolium in order to inscribe its second folio inconsecutively. An Oriental paper manuscript from 1168[26] is the first extant Hebrew dated manuscript in which the copyist inscribed folio catchwords regularly (sometimes the last word of a folio was repeated at the head of the consecutive one instead of a catchword). Notably, this copyist did not write catchwords in the middle openings of the quires, according to the abovementioned custom of several later copyists who employed bifolium catchwords.

The spread of the folio catchword method outside of the Orient matches the spread of the use of paper. It was this method that was used to ensure the order of the codex in approximately two-thirds of all the dated manuscripts and which were written on paper or mixed paper and parchment during fourteenth and fifteenth century, while in parchment manuscripts it appears in just over 10 percent of them. In the Middle East the method became widespread only in the second half of the fourteenth century, although the standard use of paper had begun there already in the beginning of the eleventh century. In the fifteenth century the method is evidence in 76 percent of all manuscripts in the corpus in which the writing material is either paper or mixed paper and parchment (and in Yemen a slightly lower figure). In the zones of Sefardic culture, where paper became a common writing material before it spread to other regions of Europe, the earliest occurrence of folio catchwords is in a Provençal parchment manuscript, produced in 1284 (as in numerous other manuscripts, sometimes repeated words rather than catchwords were written in it).[27] As in the Orient, in the Sefardic zones the method became widespread in the fourteenth century alongside the spread of paper, and came to be used in the vast majority of paper (or mixed paper and parchment) manuscripts in the fifteenth century (86 percent; this ratio takes into account the number of hands in manuscripts written by multiple hands). In Byzantium also the earliest use of catchwords was found in a parchment manuscript from the end of the thirteenth

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[26] MS St. Petersburg Евр.-Араб. I 1404, written in the 'Island of Kaftor' (Damieta, Egypt, see *Codices hebraices*, Part IV, Manuscrit 77), the earliest signs of this method are already seen here and there in the manuscript of Saʿadia Gaon's Tafsīr, a translation of the Pentateuch into Judaeo-Arabic kept in a private collection in Israel, which was written by Ephraim ben Sar Shalom HaRofe HaLevy in Masiaf (Syria) in 1146. The dates cited below are of manuscripts in which the folio catchwords are used regularly (sometimes replaced by repeated words). Manuscripts in which the folio catchwords appear sporadically only occur in all zones, and they predate the manuscripts in which the use of catchwords is regular.

[27] MS Parma Parm. 3239 (De-Rossi Catalogue 298), written in Tarascon.

century (1298). In this region, in which the vast majority of books were produced on paper, the use of catchwords spread already in the fourteenth century, and in the fifteenth century, the rate of its use approached that of Spain. In Italy, where no evidence of use of catchwords has been found until a century later (for the first time in 1382), and where parchment continued to dominate book production for many more decades, the copyists of most paper (or of paper and parchment) manuscripts in the fifteenth century – almost half of them immigrants, from Spain and Provence especially, who may have caused the spread of the custom – adopted the new practice quickly (and its ratio in these manuscripts was around 60%). The first evidence in Ashkenaz of folio catchwords is from that approximate time (France? 1390), in a parchment manuscript. Twenty-three percent of the few manuscripts written on paper in Germany in the fifteenth century display the new method.

A4. Page and column catchwords

Catchwords written at the end of every page (rather than only on the verso page of each folio) are extremely rare, their purpose is unclear, and presumably they were written by force of habit during the copying process.[28] In Ashkenazic manuscripts in which halakhic corpora were written with integrated columns of glosses, or in multilayer copying of a basic text surrounded by commentary or of unrelated marginal texts, the fourteenth century copyists tended to add secondary catchwords at the ends of the columns of these components of the text in order to guide the reader to the correct reading sequence of these complex components.[29] These column catchwords were frequently written at the end of the final line of a gloss column or of the commentary as if they were counter-catchwords, as in the example below, where in the margins of *Hilkhot HaRIf*, copied in Spain in a square Sefardic script, a column of Rashi's commentary and other commentaries were added in 1386 in a semi-cursive Ashkenazic script.[30]

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[28] Folio catchwords that occurs randomly here and there, certainly without forethought, appears already in manuscripts from the end of the 13th century and onward. In 24 manuscripts catchwords were systematically inscribed not only on the folio verso but also on the folio recto. The earliest was written in Bursa (Turkey) in 1377 by two scribes (MS New York MS 8225). The rest were produced in the 15th century in Italy, Byzantium, the Middle East and Germany.

[29] In MS Nîmes, Municipal Library 365, copied in Italy in 1454 by a Provençal copyist, in addition to the bifolium catchwords the copyist wrote a catchword beneath the first of the two columns inscribed on the page.

[30] I have observed something like column catchwords in copies of Latin glossed Bibles, which were prepared for Thomas Becket, the archbishop of Canterbury, during his years of exile in France in 1164-
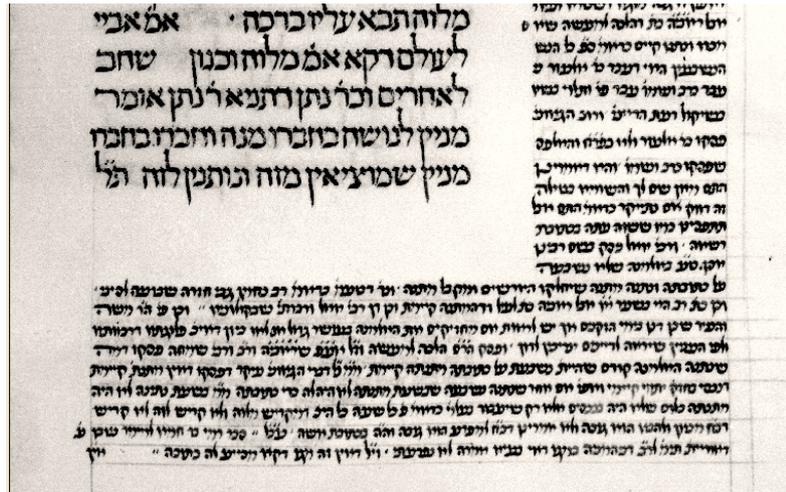
MS London Add. 17050, fol. 86v

B. Counter-catchwords

As mentioned earlier, the counter-catchword (repeated words) method is merely a variation of the catchword method, differing only in the fact that counter-catchwords do not stand out by being written outside the written area like catchwords, and for the most part they are not decorated but simply repeated and absorbed into the body text in the transition between the end of one quire, bifolium or folio and the beginning of the following one, respectively.
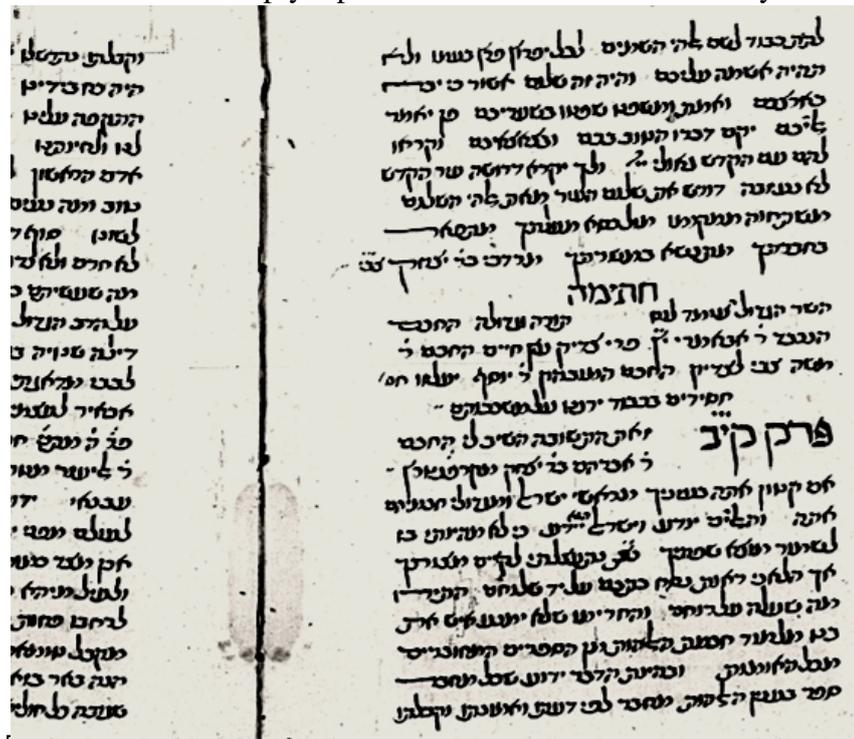
MS London, David Sofer collection110, opening of fols. 199v^200r
The word וְהִבְלַתוֹ at the end of fol. 199v is repeated at the beginning of fol. 200r

1170, and were written, to the best of my estimation, by a single hand. In these manuscripts, when an interpretive gloss written in a minute script exceeded the margins of the column, the copyists marked the end of the column and the head of the following column with an identical graphic marking, a kind of graphic column catchword. Each such gloss was given a different graphic marking in order to help the reader navigate the consecutive glosses embedded in the biblical text. See MS Cambridge, Trinity College, B. 3. 11, B. 4. 30, B. 5. 5.

The extent to which the counter-catchword method was a limited extension of the catchword method is evidenced by the manuscripts in which the two methods are mixed. Because this mode of concatenation is assimilated into the text, it is difficult to discern it. This secondary method was similar in implementation to catchwords – quires were placed in sequence by repeating the final word of one quire at the head of the following one, bifolia were concatenated with a repeated word at the head of the first half of the quire's bifolia, and repeated words similarly strung together folio to folio. The counter-catchword method was known to copyists in all zones but was prevalent mostly in Sefarad and Byzantium, and to a lesser extent in Italy. However, its use at the head of a folio actually became widespread, especially in Sefarad (19%) and in Byzantium (15%). Unlike catchwords, counter-catchwords at the heads of folios were only slightly more frequent in paper manuscripts. Scribes who copied prestigious parchment manuscripts did not hesitate to use this method because of its understated form, which is not at all noticeable to a casual glance of page, as opposed to the catchwords' pronounced form. A third of all manuscripts that employ this method – whether for quires, bifolia, or leaves – are made of parchment.

The earliest manuscript containing counter-catchwords is an Oriental paper manuscript of 1112, where the last word of the quire is repeated at the beginning of the successive quire.[31] In another Oriental manuscript, dated 1282, there are folio counter-catchwords. Counter-catchwords can be observed in many manuscripts in all the geo-cultural zones; however, in a considerable part of them they are not employed regularly, but rather as random substitute for catchwords. Outside the Orient, counter-catchwords appear in a Spanish parchment manuscript dated 1214 (one of the earliest dated manuscripts to survive from the zone of Sefardic bookmaking), where it was implemented twice – at the beginning of the quire's bifolia (including the recto of the central bifolium opening) and at the beginning of quires.[32] Folio counter-catchwords appear in a mixed-quires codex written in Tripoli (Libya) in 1293[33]. Since then many Sefardic scribes applied the repeated words at the beginning of each folio. The earliest Byzantine manuscript with regular use of folio counter-catchwords is mixed-quires codex dated 1331.[34] In Italy, as

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[31] See *Codices hebraicis*, Part III, Manuscrit 53.
[32] MS Vatican Urb. ebr. 54.
[33] MS Vatican Vat. ebr. 358.
[34] MS St. Petersburg Евр. I 479. The earliest occurrence of repeated words at the head of a few folios and quires is in the copying made by the first copyist (of the two Byzantine copyists who shared the

in the Orient, the method spread especially in the fourteenth century, and many of the scribes who employed it were immigrants from Ashkenaz, Spain, and Provence. The earliest instance of the method in Italy is quire counter-catchwords in a manuscript from 1266,[35] and it was first implemented regularly at the beginning of each folio in 1312.[36] In the Ashkenazic zone, where the use of counter-catchwords was more limited (see its distribution in table 20, below), it was first implemented regularly at the beginning of the folios in a parchment manuscript from 1322.[37]

The method of writing counter-catchwords instead of catchwords is known from a few Arabic manuscripts from the fourteenth and fifteenth centuries.[38]

2. Signatures[39]

The second main method for ensuring the correct order of the codex was the numbering of its units. Numbering quires ('signatures') in sequence was the most common method, while the numbering of bifolia, folios, and even pages was rare in medieval Hebrew manuscripts. Only folio signatures were relatively common in many dated manuscripts. Quire signatures appear for the first time in dated manuscripts in the earliest extant paper codex (which is not a small fragment), written in Fusṭāṭ (Egypt) in 1006. It is a Karaite codex written in Judaeo-Arabic, which also contains, for the first time, catchwords.[40] The use of signatures was the commonest method of securing the right

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[labour], in the earliest extant manuscripts with mixed quires, written in Alexandria in 1212 (see above, chapter 2, notes 124-125).

[35] In the copying by the first scribe who copied most of MS Parma Parm. 2750 (De-Rossi Catalogue 422; cf. Richler & Beit-Arié Catalogue [Parma] 762), which was produced in Salerno in southern Italy.

[36] In a parchment manuscript written in Bevagne, MS Parma Parm. 3256 (De-Rossi Catalogue 682).

[37] MS Parma Parm. 2476 (De-Rossi Catalogue 1101), written in זולוטר (apparently Solothurn, Switzerland).

[38] See the article by Guesdon, (above, n. 10), p. 68.

[39] 'Signature' in English and in French; 'signatura' in Italian and Signaur in German. From the 13th century onward double signatures were customarily used in Latin manuscripts – numbering of the quires as well as an internal numbering of the quire's bifolia. Such double signatures were known in Hebrew printed books, where it was required by the method of imposition and folding of the printed sheets. In Hebrew manuscripts this method is rare. The type of signatures has been defined according to the units of the material divisions of text – quire signatures, bifolia signatures, and folio signatures.

[40] See *Codices hebraicis*, Part I, Manuscrit 16. The presence of quire signatures in MS Cairo of the Prophets, ostensibly written by Moshe Ben Asher in 894/5 in Tiberias (ibid., ms. 1) and the absence of signatures in 10th century manuscripts reinforce the doubts regarding the authenticity of its colophons. Like the quire signatures by the scribe of MS Cairo, the quire signatures in MS St. Petersburg, Oriental Institute D 62, with an ostensible sale date of 847, provides a further argument against the authenticity of this notice of sale.

order of a codex in the early periods in the Orient,[41] but there is still no evidence of it in the earliest manuscripts produced in North Africa or Italy. Usually signatures coexist along with quire catchwords, serving as parallel and double means for ensuring the correct order of a codex's quires, as in the abovementioned earliest manuscript of 1006. However, of all the dated manuscripts whose quires are numbered, quire signatures appear alone without catchwords in more than a tenth of them, most produced in the Orient (where more than a quarter of manuscripts were numbered in similar fashion) but also in Spain (where quire signatures appears in one seventh of all manuscripts).

The digits in all the numbering systems are expressed almost exclusively by Hebrew letters, which is the normal means of numeration in Hebrew.[42] In the Middle East, parallel signatures were not infrequently added in Arabic, along with the numbers in word form in Arabic script,[43] presumably intended for a non-Jewish

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[41] See e.g., the manuscripts mentioned in n. 51 below.

[42] The same practice was also followed by Greek, Latin, and Syriac copyists, see Briquel-Chatonnet, 'Cahiers et signatures dans les manuscrits syriaques' (above, n. 9). It should be recalled that the Jews inherited the method of using the letters of the alphabet for numerical notation and for *gematria* from the Greeks (see recently, G. Darshan, 'Twenty-Four or Twenty-Two Books of the Bible and the Hommeric Corpus', *Tarbiz*, 77 (2007), p. 20 (in Hebrew). The numeration of quires with Greek letters was added to MS Jerusalem Heb. 8° 3941, a Byzantine manuscript from the 13th centuy, which contains a corpus on medical works by Maimonides in an unknown Hebrew translation; see M. Beit-Arié, 'A Palaeographical Description of the Jerusalem Hebrew Manuscript', in *Moses Maimonides on the Causes of Symptoms*, ed. J.O. Leibowitz & S. Marcus, Berkeley – Los Angeles – London 1974, pp. 34–38. Similarly, Greek letters were written at the head of the quires in MS Leipzig, UB B.H. 13, copied in Saloniki in 1329; however the end of the quires display Hebrew numbering. In MS Oxford MSS. Poc. 314, 344 (Neubauer Catalogue nos. 318-319) written in Tripoli, Lebanon between 1380-1385, the heads of the quires were numbered not with letters but with dots in the upper left-hand corner (cf. a similar phenomenon in the Greek manuscript described below in n. 52). In the first ten quires of MS Paris Hébreu 169 (*Manuscrits médiévaux* II, 8), which was produced in Italy in 1253, the quire numbers were noted with words. Quires were similarly numerated in one of the few manuscripts from Ashkenaz that was numbered, MS Oxford MS. Mich, 502 (Neubauer Catalog 882), written apparently in France without a date notation (apparently between 1296 and 1320). In this manuscript the numbers were noted within rhyming blessing formulae, e.g. סיימתי קונטריס רביעי, יברכני ה׳ רועי.

[43] As customary in Arabic manuscripts. See Guesdon, 'La numération des cahiers et la foliotation' (above, n. 10). Guesdon notes there that the numeration of quires was generally written in word form, but that Qur'anic quires were never numbered. See also her comments about the means for ensuring the order of the codex in Arabic manuscripts, in the subchapter she wrote ''Systems to Indicate the Order of Folios' (above, n. 10), p. 90. There she noted only the lack of numeration of quires in early Qur'ans (François Déroche notes that these quires were not numbered until the 15th century; personal communication). In the aforementioned subchapter (ibid*.,* p. 95) Guesdon describes an Arabic manuscript of the *Canon* by Avicenna which was copied in 1130 (MS Paris arabe 1130), and was owned by Jews, in which the numeration of quires and foliation is written in Hebrew letters.

binder, and based on the different ink in which many of such signatures were written, they may also have been added by the binder.

The double signatures in Hebrew and Arabic are very common, appearing in almost half of Oriental manuscripts with quire signatures, almost all of which are written in Judaeo-Arabic. Usually the Arabic equivalent numbers in word are added only opposite the Hebrew signatures at the beginnings of the quires (even when the ends of the quires were also numbered) at the upper left corner.[44] In some two dozen of these manuscripts the parallel signatures are written in Arabic numerals and not in words in Arabic script. The addition of the Arabic signatures to Hebrew ones was already in use in the eleventh century. Arabic signatures were also added in an early period to the Hebrew signatures which had been added by a different hand to the earliest manuscript containing the entire Bible, written in Cairo in 1008.[45]

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[44] In MS St. Petersburg Евр.-Араб. I 1346, which was copied in the Orient in 1397, numeration was added in Arabic words not only at the heads of quires but also at their ends (without using Hebrew numeration). The same method is used in MS St. Petersburg Евр.-Араб. I 1817 from 1452, in which the ends of quires were numbered with Hebrew letters. In this manuscript the word كراس, i.e. quire, is written in Arabic script above the number in Arabic which is rendered in Hebrew script, and this form appears also in several later manuscripts, apparently all Karaite ones.

[45] See *Codices hebraicis*, Part I, Manuscrit 17. The numbering of quires in Arabic only has survived in a fragmented Oriental manuscript written in 1048 (see *Codices hebraicis*, Part II, Manuscrit 33, and in a manuscript copied in Aden in 1114, ibid., Part IV, ms. 70). In parallel to the Hebrew signatures, which appear at the head of the quire in the upper right-hand margins, the Arabic signatures are written on the opposite side in the upper left-hand margins. Numbering in word form in Arabic also appears in a complete quire that has survived from a draft of Maimonides' *Mishne Tora* in his own handwriting – MS Oxford MS. Heb. d.32 (fol. 47r) – as well as in one of the autographed manuscripts of his commentary on the Mishna – MS Oxford MS. Hunt. 117 (Neubauer Catalogue 393), in which all the beginnings of the quires are numbered with Judaeo-Arabic words only.
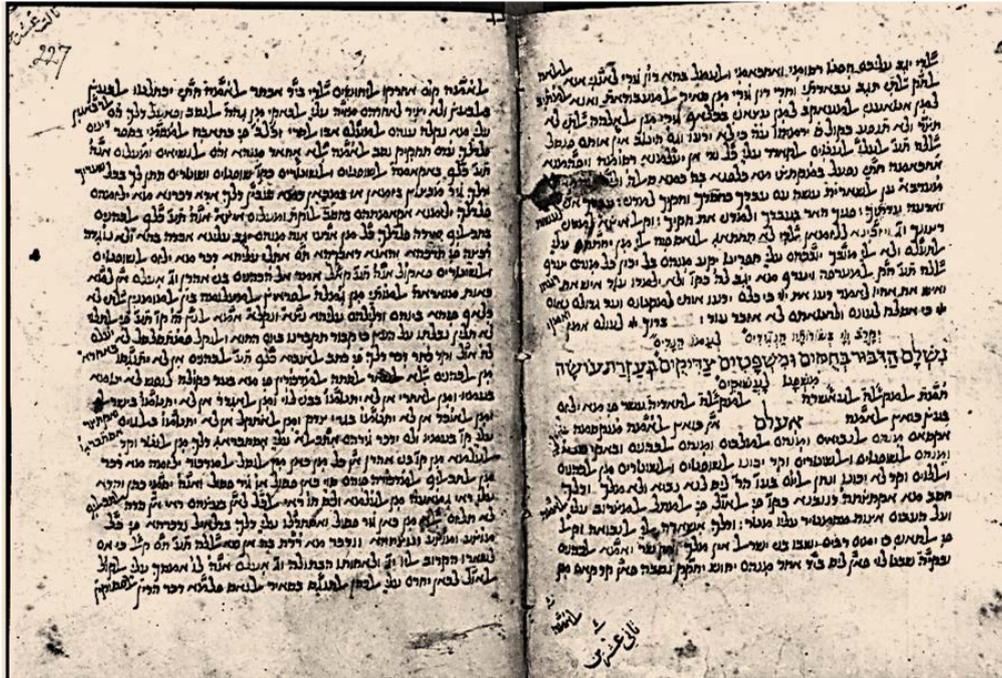
Signatures at the head and the end of a quire in Hebrew letters and Arabic words
MS Berlin Ms. Or. 8° 351, fols. 226v^227r

2a. Quire signatures

Quire signatures were especially common in the Orient, where they are found in almost two thirds of non-fragmented dated codices, and particularly in Yemen, where they occur in 89% of manuscripts, as well as in Italy, where the rate was 45% (although the rate in parchment manuscripts produced in Italy was even greater and similar to the rate of quire signatures altogether in Oriental manuscripts).[46] Merely partial numbering appears in one of the earliest dated manuscripts, produced apparently in Italy, MS Reuchlin of 1105/6,[47] but its regular use in manuscripts produced in Italy appears for the first time only in a manuscript from 1246/7.[48] Signatures were also common in Sefardic book culture (in slightly more than a quarter of all the dated manuscripts), but were extremely rare before the final quarter of the thirteenth century. Byzantine manuscript contained quire signatures only rarely and they are practically non-existent in Ashkenazic

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[46] In Hebrew parchment manuscripts produced in Italy in the 15th century signatures were tenfold more widespread than in Humanist parchment manuscripts, among which, according to the extensive survey by Derolez (*Codicologie*, vol. 1, p. 63), the ratio of manuscripts with signatures is only 6.6%.

[47] See *Codices hebraicis*, Part III, Manuscrit 48.

[48] See *Manuscrits médiévaux* II, 7. However, note that only one dated manuscript, from 1145, has survived from Italy between these two manuscripts (See *Codices hebraicis*, Part IV, Manuscrit 71).

manuscripts.[49] In all regions (except for Ashkenaz of course, and the Orient) quires signatures were more common in parchment than in paper quires. In the dated corpus codices of the Sefardic zones containing quire signatures, the proportion of parchment manuscripts is twice that of paper manuscripts (67% versus 33%). In Italy the difference is even greater (78% versus 22%). This characteristic cannot apply to the Orient in which most manuscripts were made of paper.

The placement of the quire signatures
The placement practice relates to two positions – the position of signatures in the quire and their place on the page in which they are written. The numbering in Hebrew manuscripts may be written at the head of each quire only (except for in the first quire), or at the end of the quire only (except in the last quire), or at the beginning of each quire and once again at its end, and in a few manuscripts at the beginning of each quire, with the same number appearing at the end of the preceding quire, as a kind of signature-catchword. Almost without exception, the numerator letters were inscribed at the upper right corner of the first page of the quire when quire beginnings were numbered, and at the lower left corner of the last page (close to the placement of the catchwords) when the ends of the quires were numbered.[50] From among all the manuscripts containing quire signatures the ratio of manuscripts with double signatures, at the beginning and end of the quires, is 56%; the ratio of manuscripts with signatures at the beginning of the quires is 30%, and with signatures at the end of the quire 19% (the number of manuscripts containing quire signatures is smaller than the total number of manuscripts counted by reference to the placement of the signatures, because the manuscripts

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[49] From among 361dated Ashkenazic manuscripts before 1540, quires were numbered in only a dozen of the 13th century manuscripts, and in a comparable number of undated and unlocalised manuscripts. In connection with this issue, see Thérèse and Mendel Metzger comments in Beit-Arié, *Makings* ('Addenda and Corigenda', p. 139). Some of these signatures were executed in an unusual manner, similar to catchwords (see below, section 2a (4): signature appearing at the end of a quire and at the head of its successor).

[50] In MS Oxford MS. Hunt. 164 (Neubauer Catalogue 1249), produced in Mardin in East Turkey, signatures were written at the heads of the quires in the left corner of the upper margins. In MS San Francisco, Sutro WPA 106, copied in Yemen in 1299, beginnings and ends of quires were numbered at the upper right-hand corner, and sometimes in the middle of the upper margin, and in MS St. Petersburg Евр. II B 4, written in the Middle East, apparently during the first half of the 11th century, all the signatures, whether at the beginning or the end of the quires, are written in large letters in the middle of the upper margins, while in MS Vatican Vat. ebr. 15, a German manuscript written in 1320 with a unique type of signatures in the style of a catchword (see below, section 2a (4): a signature appearing at the end of a quire and at the head of its successor), the quire signatures appear in the lower margins of the quire's last page, and on the facing first page of the next quire.

containing some quires with one signature placement and others with a different signature placement were counted more than once. Since the ratios relate to the number of the manuscripts in the corpus, the sum of the two ratios exceeds 100 percent).

Not one of the geo-cultural zones adheres to a single positioning, but regional preferences are noticeable. Generally delineated, the following is the regional distribution of the signature placement in quires: In the Orient, most of the manuscripts with quire signatures place them at the head; until mid-twelfth century this is the placement witnessed in all the extant manuscripts. Double numbering appears in less than a quarter of the manuscripts manufactured there and in less than a tenth of them the numbering exists at the end of quire. These data indicate that many manuscripts are not uniform in regard to the positioning of the quire signatures. In Yemen almost two-thirds of the manuscripts have double signatures, and in about a third the signatures are at the head. In Sefarad the ratio of double placement is similar to that of Yemen, but it is placed at the head only in less than a quarter of them, and the ratio of manuscripts with end signatures is slightly greater. In Italy more than two-thirds of manuscripts have double signatures, around a quarter have end signatures and only one tenth of them has head signatures. In Byzantium the number of manuscripts with quire signatures is very small.

2a (1) Signatures at the head of each quire only
As noted, all early Oriental manuscripts (before the middle of the twelfth century) containing quire signatures or remnants of signatures display the numbering at the head of the quire, at the right-hand corner of the upper margins.[51] Because of this location, many signatures have been damaged (as well as head signatures using double numbering) or have not survived at all, especially when the numbering was inscribed near the edge of the page. The numbering was written in Hebrew characters. This was also the standard method of numbering quires in the Middle East in the later period.
The placement at the head of the quire is identical to the placement of quire signatures in early Greek manuscripts,[52] however, taking account the direction of writing, there is

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[51] E.g. *Codices hebraicis*, Part II, mss. 20-23, 26, 27, 33, 34.
[52] See Irigoin, 'Centres de copie byzantins' (1958), p. 222, where he writes that this placement of the signatures is characteristic of Greek manuscripts before the 9th century; Turner, *Early Codex*, pp. 77-78. Turner notes that when the numbering was repeated at the end of the quires in early Latin codices, it was usually written in the lower right-hand corner or middle of the lower margins, and that signatures in

of course a difference between the Hebrew custom of placing the numbering at the right upper margin and the Greek custom. The influence of Syriac manuscripts on the design of the Oriental Hebrew codex was probably greater; in these manuscripts, from the time quire signatures are first witnessed in the sixth century, double numbering was used at the head and end of each quire (as in many Hebrew manuscripts, as will be shown below), and its placement is almost always in the middle of the lower margins.[53]

Among Hebrew manuscripts the placement of quires signatures at the head only was widespread in Oriental manuscripts (80% of manuscripts with quire signatures, 37% of manuscripts written in Yemen). Outside of the Middle Eastern zones quire signatures placed at the head were less frequent (19% in Sefarad, 10% in Italy).

Quire signature placed at the head of the quire * <Persia> 1106/7
MS Jerusalem Heb. 8º 2238, fols. 16v^17r

Roman numerals were preceded by the letter Q (quaternio, a quire made of four bifolia). Cf. Lowe, *CLA*, vol. 6, p. vii. According to Lowe, early Latin codices between the 5th century and 800 displayed quire signatures at the beginning of the quire only, and in Latin nimerals, usually preceded by the letter Q, as mentioned above. See E.A. Lowe, 'Some Facts about our Oldest Latin Manuscripts', *The Classical Quarterly*, 19 (1925), pp. 197–203, 208 (=*Palaeographical Papers 1907–1965*, ed. L. Biehler, vol. 1, Oxford 1972, pp. 188–195, 202); idem, 'More Facts about our Oldest Latin Manuscripts', ibid., 22 (1928), pp. 44–57, 59–60 (= ibid., pp. 252–267, 271–272).

On the numbering of quires in Greek manuscripts in later periods, see J. Leroy, 'La description codicologique des manuscrits grecs de parchemin', in *La paléographie grecque et byzantine*, ed. J. Irigoin & J. Bompair (Colloques Internationaux du CNRS 559), Paris 1977, pp. 39–41. Unlike the Latin manuscripts, in which the placement of the signature was usually in the lower margins of the final page of the quire, in Greek manuscripts the placement varied. This variation is apparent already in the 8th and 9th centuries. Leroy cites examples of signature notations in the form of dots and punctures. On signatures at the head and end of the quire and the great variation in placement of signatures on the page, cf. the article by B. Mondrain, 'Les signatures des cahiers dans les manuscrits grecs, in Hoffman (ed.) *Codicologie comparée*, p. 23.

[53] Briquel-Chatonnet, 'Cahiers et signatures dans les manuscrits syriaques' (above, n. 9).

2a (2) Signatures at the end of the quire only

The method of placing signatures at the end of the quire only was not very widespread and was implemented in less than a fifth of the manuscripts with quire numbering. While it was not a preferred method in any region, it nevertheless stands out more in manuscripts written in Sefarad (23% of the manuscripts with quire signatures) and in Italy (24%), while in the Orient and in Yemen, where quire signatures were widespread, the ratio of manuscripts that display this method is less than a tenth. Only a few manuscripts with quire signatures are found in Ashkenaz, a third of which display numbering at the end of the quire.

2a (3) Signatures both at the head and end of the quire

Double numbering of quires had a clear advantage over single numbering, since the order of the quires and their sequencing was apparent at each transition from one quire to the next. The earliest evidence we have of double numbering in Hebrew manuscripts is from a Hebrew codex written in the Orient in 1112, in which one of the quires was numbered both at the beginning and at the end.[54] Double numbering appears regularly for the first time in another Oriental manuscript written in Damascus in 1161/2.[55] In the Iberian Peninsula double numbering appeared for the first time in Gerona in 1184 in the earliest parchment manuscript that survived from that zone,[56] and in the Italian peninsula the earliest evidence of double numbering is from 1246/7.[57]

This method was preferred in Yemen, where its rate is 63% of signatured manuscripts, in Sefarad the rate is of 60% of such manuscripts and in Italy 69%. The frequency of manuscripts with this manner of signatures in Italy before the fifteenth century was even greater, but it lessened considerably in the fifteenth century, when the rate was only 20%, mostly in parchment manuscripts. The sharp decrease was the result of the increase of paper manuscripts: because they were so fragile the copyists preferred to implement means of preserving the order of folios. In fifteenth century Spain there was also a drop in the rate of manuscripts using double numbering. In the Orient (except for

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[54] See *Codices hebraicis*, Part II, Manuscrit 7.

[55] MS London Or. 2595 (Margoliouth Catalogue 952) and MS St. Petersburg, Евр.-Араб. II 675 (a fragmented manuscript that was split, see *Codices hebraicis*, Part IV, Hebrew introduction, MS D).

[56] The famous manuscript of the Talmud that includes the three 'Bava' tractates, MS Hamburg Cod. Hebr.19 (Steinschneider Catalogue 165).

[57] See *Codices hebraicis*, Part II, Manuscrit 7.

Yemen) the method had a smaller yet recognisable distribution – around one fifth of all the manuscripts. In the Byzantine zone, where the signature method did not spread at all, the use of double numbering was negligible, and in France and Germany the method never occurs.
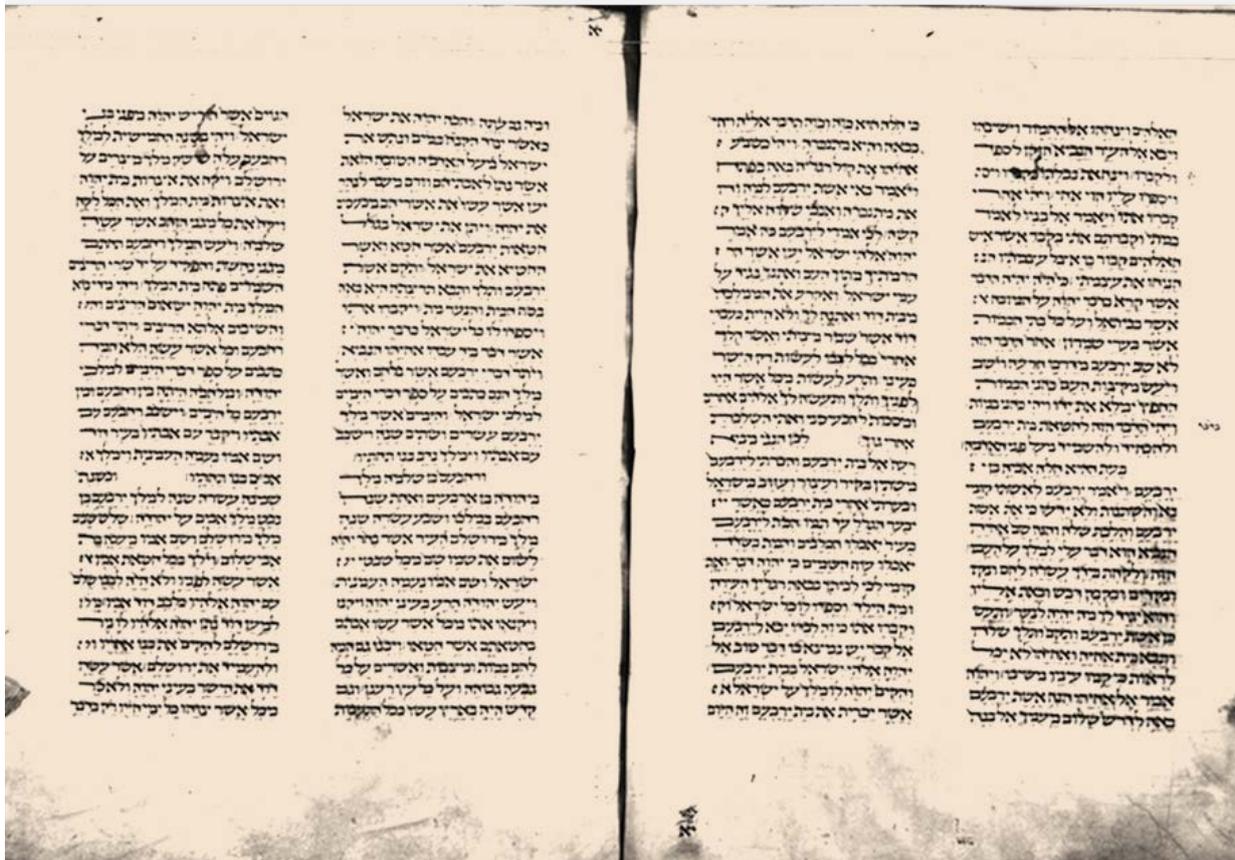
MS Hamburg Cod. hebr. 3 <Germany, last third of 13th century>, fols. 79v^80r
Numbering quire 11 at the end of a quire on the right page of the opening repeated at the head of the following quire on the left page of the opening

2a (4) Numbering at the end of the quire and at the head of the next quire (counter-signatures)

This rare numbering method involved numbering the end of the quire and repeating the same signature at the head of the next quire, as if it were a kind of quire catchword.

This method is unusual, and its earliest witnesses were discovered in Ashkenaz – a zone in which scribes did not usually number quires – in a few undated manuscripts from Germany and France from the thirteenth century. This discovery was a random one, since manuscripts that were either undated or lacked the name of the copyists were not documented in the database of manuscripts. The signatures appear in a few of the manuscripts with a date – two from fourteenth century Ashkenaz (from 1320 and from 1347) and a few from Byzantium, Provence, and Italy from the fourteenth and fifteenth century.

2b. Bifolium signatures

Numbering of bifolia, folios, and pages was not at all common in Hebrew manuscripts. The numbering of quire bifolia on the verso folios in the margins of the first half of the quire is extremely rare in medieval Hebrew manuscripts. In Latin manuscripts numbering of the bifolia of each quire, always accompanied by the quire signature, appeared in the twelfth century.[58] Among dated Hebrew manuscripts the first witnesses for the use of double signatures to ensure the order of the quires in a codex, and the order of the bifolia within each quire are from the Middle East, and they appear in a number of paper manuscripts in Judaeo-Arabic (especially Karaite manuscripts), written from the middle of the twelfth century[59] until the late fourteenth century. The numbering of the quire bifolia generally following the method of numbering in Latin manuscripts, but indicating, in effect, the influence of Arabic manuscripts. In early Oriental manuscripts the bifolia signatures are written in conjunction with the quire signatures, usually in Arabic but also in Hebrew, e.g. בי׳ מן ג׳ (i.e. the second bifolium of the third quire, etc.).[60] Outside of the Orient, bifolia signatures appeared in Germany at a later date and infrequently (for the first time in 1392 in a dated manuscript)[61], in Italy (for the first time, apparently, in the beginning of the fourteenth century in a manuscript written in Salerno, but the scribe, who wrote two colophons with his name

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[58] See J. Vezin, 'Les cahiers dans les manuscrits latins', in Hoffman (ed.) *Codicologie comparée*, p. 103-104. As the practice of numbering bifolia became widespread in Latin codices, the number of each quire was written on each bifolium next to the number of the bifolium (cf. above, chapter 4, end of n. 14), as it did later in print books. In Hebrew printed books the method of numbering bifolia paralleled the numbering methods of Latin printed books.

[59] The earliest manuscript was written in Masiaf (Syria) in 1146 (see *Codices hebraicis*, Part IV, Hebrew introduction ms. A).

[60] In six quires of MS St. Petersburg Евр.-Араб. I 671 (see *Codices hebraicis*, Part IV, Manuscrit 88), the numbering the bifolia – except of course for the first (outer) one, where the numbering is not necessary – made use of the ordinal number of the bifolium within the quire, which was also numbered ordinally. The numbering was inscribed in Arabic numerals and in Arabic script in all the bifolia, and worded usually "5 of 2" (i.e. fifth bifolium of the second quire). On the Arabic custom see P. Orsatti, 'Le manuscrit islamique: caractéristiques matérielles et typologie' in Maniaci & Munafò (eds.), *Book Materials and Techniques*, vol. 2,318-319.

[61] In an undated Ashkenazic quire from the end of the 13th century or the beginning of the 14th century (MS Berlin Ms. Or. 4° 701 [Steinschneider Catalogue 148],fols. 96-105), at the bottom of the third folio (fol. 98v) the copyist noted in large letters the words שלישי הראשון (i.e. the third folio in the first quire) and at the bottom of the fourth folio (fol. 99v) he noted: ארבע הראשון (i.e. the fourth folio of the first quire, reversing the order of the previous notation).

and that of the person who commissioned the copy, did not inscribe the date, and later in a few dated manuscripts written in the fifteenth century), and very seldom in Spain.[62]

2c. Foliation (folio signatures)

Numbering of leaves (foliation) in the copyist's own hand was not at all common, and appears in only one percent of the manuscripts in the corpus under discussion (during the first decades of the sixteenth century there was a considerable increase in its use). Foliation was sometimes the custom in Spain and Italy, but not in the Middle East or Byzantium. Only in Spain, for the first time in 1272,[63] was foliation used in a larger number of manuscripts with relative continuity, especially in parchment manuscripts. While the earliest extant example of foliation from Italy is in a manuscript from 1286,[64] subsequent to this single manuscript foliation is evidenced only in the fifteenth century. A small number of foliated manuscripts from Ashkenaz survived from the second half of the fifteenth century.

This simple method of preserving the order of the codex's leaves was of course also the easiest means for navigating the text, allowing the user to search the book, locate text versions and provide references. Unlike the other methods for ensuring the order of the codex, described above, foliation is not a method whose purpose is to preserve the consecutive order of the codex's pages for the benefit of the producers of the codex – the copyist and binder; its purpose is rather to benefit the user of the book, providing him with a tool for searches and citations. It is no wonder then that the first foliated manuscripts were Biblical books, and that half of all the few foliated manuscripts are Biblical books. Many of the other foliated manuscripts contain halakhic works that were frequently consulted, and which had a vital need for a means of locating text passages. And yet, because of the relatively late development of indexing and tables of contents in copyings of Hebrew works, which required accurate means of referencing the text, the implementation of means for ensuring the order of the codex on each page was a late occurrence in Hebrew manuscript, and in truth, this tool for search and citation was

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[62] In MS New York Rab. 15, made of mixed quires, written in Ubeda (Spain) in 1290, bifolia signatures survived in only two of the inner paper quires. The signatures, which may have been added by a second hand, are doubled in the two halves of the bifolia - on the recto page in the first half of the quire and on the verso page in the second half.

[63] MS Paris Hébreu 26, which was written in Toledo (*Manuscrits médiévaux* I, 8).

[64] MS Vatican Ross. 554. The first twelve quires of this manuscript were numbered, but after the thirteenth quire, consecutive foliation replaces the quire signatures. In MS London, BL Or. 10337, a Judaeo-Italian prayer book which was presumably written for women, apparently at the turn of the fifteenth and sixteenth centuries, the foliation is in Italian words rendered in Hebrew characters.

hardly developed in them at all. Indeed, foliation was relatively widespread in Latin manuscripts as early as the twelfth century,[65] and especially from the thirteenth century onward they show the development of alphabetical indices accompanied by references to a textual location in the codex. In contrast, halakhic works for which the means of locating text is vital, had only developed notations of lemmas (סימנים) and of lists heading or ending the works, in which the lemmas were listed in order with an abbreviation of their contents.

Another means of locating text that should be mentioned in this context and that was added to Biblical manuscripts and their commentaries as well as to other works, were the 'running' titles of books or parts of works, written at the heads of pages and of bifolia, to help the reader navigate the text. Similarly, notations in the margins in Biblical manuscripts were used mostly to indicate the *haftara* portions, orders (*sedarim*), and open and closed parashas. Chapter 8, below, provides an extensive discussion of the means copyists use to facilitate comprehension of the text and comfort of use and reading.

In Arabic manuscripts from the Middle East – both Muslim and Christian – and from the Maghreb, foliation was rare.[66]

Pagination (the numbering of codex pages) is found only in a few manuscripts written in the fifteenth century, especially in the latter half, in Ashkenaz, Italy, and Spain.

3. Marking the middle opening of the quire

To prevent folding the unbound quire's bifolia backwards, it was customary to mark the quire's central opening, the fold at which the stitching of the quire's bifolia must begin. This mark, adopted from the practice of Arab copyists or binders, does not in fact ensure the correct order of the quires, but is rather a means that is apparently designed to prevent the quire's bifolia turning inside out at their opening, before being sewn by the binder. Such an inversion, which can indeed be found here and there in Hebrew European manuscripts, of course upsets the correct order of the quire's folios.

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[65] MS Vatican Ross. 554. The first twelve quires of this manuscript were numbered, but after the thirteenth quire, consecutive foliation replaces the quire signatures. In MS London Or. 10337, a Judaeo-Italian prayer book which was presumably written for women, apparently at the turn of the fifteenth and sixteenth centuries, the foliation is in Italian words rendered in Hebrew characters.

[66] According to Guesdon's article, 'La numération des cahiers et la foliotation' (above, n. 10).

The central opening of the quire was marked in the corners of the central bifolium, usually with a different coloured ink than that of the written text, and therefore it appears that this marking was not made by the copyist but by the binder,[67] or eventually by the owner who gave over the book for rebinding. The central opening was marked in various ways. Sometimes only two corners were marked – the lower-outer corner to the right of the opening (verso) and upper-outer corner to the left of the opening – or vice versa, the upper right-hand corner and the lower left, and sometimes all four corners were marked. The shape of the marks is also varied, but for the most part they are brief slanted pen strokes, sometimes thickened, like a Z symbol, which may have perhaps been made by a different instrument or perhaps in a later period.

Marking of a central quire opening * <Safed?> 1484
MS Oxford MS. Hunt 372, fols. 205v^206r

The appearance of these markings already in manuscripts prior to the year 1006 – the same year in which the two main means for ensuring the order of the quires (catchwords

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[67] In an Arabic work on the art of binding and gilding, the author Abu Al-Abbas Ahmad Ibn Muhammad Al-Sufyiani instructed the binder to mark the middle of the quires with a special instrument. See the English translation by P. Ricard, in an appendix to a work by Levey, *Mediaeval Arabic Bookmaking*, p. 5. The adding of markings with a different ink from that of the text as well as the above cited Arabic source reveal that it was not the scribes who marked the central (which is also the final) bifolium of the quire to indicate that no bifolia were missing.

and signatures) appear – does not suffice to prove that the use of this early technique predates their use. If we ignore the remains of markings in a manuscript written ostensibly as early as 894/5, but which in fact, as mentioned, was written about one hundred years later than the date inscribed in it,[68] we find that the earliest marking of the central opening of a quire is from a fragment of a manuscript from 929[69] as well as in the Aleppo Codex, dated from around the same year.[70] The next marking appears in dated manuscripts from 988/9, 1020/1, 1021-1023, 1034, 1048.[71] In non-fragmented manuscripts the marking can be found in almost one eighth of those written in the Orient and in 56% of those produced in Yemen.

Evidences for markings of the central opening have also been found in the Islamic territories outside the Middle East, although examples are few: the earliest witness comes from the earliest extant manuscript from the zones of Sefardic book culture and generally from outside the Middle East – MS St. Petersburg Евр. II B 124, written in the eighth century of the fifth millennium according to the Hebrew calendar, i.e. between 941 and 1039,[72] and more witnesses are found in a few manuscripts from North Africa dating from the fourteenth and beginning of the fifteenth century.

Marking the middle of the quire was very common in Arabic manuscripts even though this practice was only noticed in 1983. Indeed, Guesdon, who intensively researched this practice and even catalogued its forms, discovered it in a great many manuscripts from the Maghreb as well.[73] According to the Arabic manuscripts she examined in France's Bibliothèque National in Paris, the marking appears especially in manuscripts produced from the end of the eleventh century until the middle of the fourteenth century; however she did not find many witnesses of the practice in Oriental Christian manuscripts (Syriac or Coptic). Guesdon hypothesizes that the marking was intended to prevent mixing up the quire's bifolia during the binding process, and that perhaps

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[68] *Codices hebraicis*, Part I, Manuscrit 1

[69] Ibid., ms. 5.

[70] Ibid., ms. 6. The existence of three systems for marking the middle quire in this manuscript demonstrates clearly that this marking was added over the course of generations during the rebinding of the codex.

[71] Ibid., ms. 12; ibid., ms. 22, 26, 33.

[72] *Codices hebraicis*, Part II, Manuscrit 29.

[73] See M.-G. Guesdon, 'L'assemblage des cahiers : Remarques à propos d'un echantillon de manuscrits arabes récemment catalogués', in *Le manuscrit arabe et la codicologie*, ed. A.-C. Binebine, Rabat 1994, pp. 57–68; Guesdon, 'Les réclames dans les manuscrits arabes' (above, n. 10) ; idem, 'Systems to Indicate the Order of Folios' (above, n.10), pp. 99-101 (in ibid., p. 100-101 she also discusses the forms of marking).

the mark was made even before the copying process.[74] In regard to the form of the marking, Guesdon has commented that in the earliest Arabic manuscripts that included the marking, it is in the form of the numeral 5 according to the *rūmī* numeral system.[75] A similar custom is found in Latin manuscripts, as the late codicologist and historian of the British book N.R. Ker has brought to my attention. According to Ker, the recto of the central opening of a quire was marked by cross markings at the lower margin. In English manuscripts from the fourteenth century, a cross was frequently marked at the fold of the central opening, with its horizontal arms crossing the fold, and sometimes instead of a cross a simple pen stroke crosses the fold.[76] A few examples of other methods of marking the middle opening of the quire have been found in Greek manuscripts – numbering the quires at their opening (presumably to mark the opening) and writing the word 'middle' in Greek in the middle of the lower margin on the first page of the second half of the quire.[77]

Markings of the middle of the quires are of great avail to codicologists and textual scholars in the attempt to reconstruct the composition of quires and lacunae of damaged and fragmented manuscripts.

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[74] This is a questionable hypothesis if one considers the function of the marking, and it is contradicted by the colour of the ink of many of these markings, which differs from the colour of the ink of the copying of the main body text. However, Guesdon notes that the colour of the ink in Oriental manuscripts – unlike that of Maghrebi manuscripts – is similar to the colour of the ink in the text.

[75] Guesdon, 'Systems to Indicate the Order of Folios' (above, n.10), p. 100. The earliest manuscript she cites is from 1079/80. At any rate, especially common in the Hebrew Oriental manuscripts is the marking that resembles the numeral 5 in the system entitled *ghubār* (see ibid.*,* p. 97, photographs of both numeration systems and her comment, ibid.*,* p. 100, on the Maghrebi binder's recommendation in his treatise from 1619 to mark the middle of the quire with a *ghubār* numeral 5). The use of the numeral 5 or of an evolved form thereof is appropriate to the quinion composition of the Oriental manuscript, and it is therefore meant to designate the fifth, central bifolium in the quire.

[76] Letter from November 8, 1970. I have noticed cross markings (in an ink unlike the text ink) in Latin manuscripts from France, e.g. MS Cambridge, Trinity College, B. 3.11 written for Thomas Becket during his years of exile in France in 1164-1170 and in MS Cambridge, UL Pf. 5.31 from 1299. For a similar marking in manuscripts bound by the famous anonymous binder known as Scales Binder in 15th century England, see N. Barker, *Form and Meaning in the History of the Book – Selected Essays*, London 2003, p. 38. See also the suggestion by Gumbert, (*Words for Codices*, section 316.7) to use the term 'centre signature' in English to designate this marking and his comment that the cross marking in the central opening indicated that there were no missing bifolia in the quire.

[77] See the article by Mondrain, 'Les signatures des cahiers dans les manuscrits grecs' (above, n. 52), pp. 23-24.

Decorative Masora in transitional openings between quires

In at least three dozen dated Bibles that include decorative Masora one finds that in the transitional openings between successive quires (the verso of the final folio in a quire and the recto of its successor), the Masora is written in a more complex decorative manner than on other pages (except for the beginnings and ends of books).[78] Initial evidences of this form of writing appears already in early Oriental codices,[79] but in the thirteenth century the custom spread to France and Germany and also to Spain. In around one third of the manuscripts the Masora is displayed symmetrically on both pages of the opening, and of these most were produced in Spain during the fourteenth and fifteenth century. Unlike the complex decorative Masora at the beginnings or ends

MS Paris Hébreu 8, fols. 55b^56a <Germany?> 1304

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[78] This is the subject of Dalia Ruth Halperin's work 'Hamasora hame´uteret be-miftaḥei hama'avar bein quontresim', M.A. thesis (in Hebrew), Hebrew University 1999/2000, and see recently, 'Decorated Masorah on the Openings between Quires in Masoretic Bible Manuscripts', *Journal of Jewish Studies*, 65 (2014), pp. 323–348. This phenomenon was already documented in *Manuscrits médiévaux*, e.g. I, 28 (and see the photograph on this page).

[79] In MS Cairo, The Moussa al-Dar'i Karaite Synagogue, ostensibly a copying of the book of Prophets from 894/5 but without doubt deserving a date of some 100 years later (see above, chapter 1, n. 64), and MS Cairo, ibid., written in 1028 (see *Codices hebraicis*, Part II, Manuscrit 23).

of books, this means of accentuating the transition from one quire to the next was not textually, but rather codicologically motivated, perhaps in order to facilitate the preservation of the codex's order.

Tables 20-22: Geo-cultural distribution of means to ensure the order of the codex

For the basis of the statistical calculations and tabulations, see the Introduction (chapter 1), above, in the section 'General statistics of the database' (before Table 5). The data presented below in tables 20-21 are based on the corpus of dated manuscripts that display means of ensuring the correct order of the codex and which were produced before 1500.

Table 20: The distribution of catchwords and counter-catchwords

Some manuscripts display more than one catchword method and therefore the total number of manuscripts with catchwords and the total number of manuscripts per zone are smaller than the totals received by counting them according to the discrete methods. Because the percentages relate to the number of manuscripts in the corpus, the total of the percentages exceeds 100.

(1) Quire catchwords   (2) Bifolium catchwords   (3) Folio catchwords

(4) Counter-catchwords heading a quire   (5) Counter-catchwords heading a bifolium

(6) counter-catchwords heading a folio

\# number of manuscripts (disregarding multiple hands)   % percentage of the regional corpus

Zone	#1	%	#2	%	#3	%	#4	%	#5	%	#6	%	Total in Corpus
Sefarad	157	33	22	5	267	57	10	2	2	0	88	19	472
Ashkenaz	270	92	10	3	33	11	5	2	3	1	23	8	294
Italy	486	69	39	6	238	34	6	1	5	1	78	11	706
Byzantium	58	31	4	2	150	80	1	1	0	0	28	15	188
Orient	75	33	6	3	119	53	3	1	0	0	18	8	225
Yemen	61	63	1	1	26	27	2	2	0	0	7	7	97
Unidentified	8	42	3	16	9	47	1	5	0	0	3	16	19
Total	1115	56	85	4	842	42	28	1	10	0	245	12	2001

Table 21: Distribution of quire, bifolium, and leaf signatures

There are manuscripts in which signatures appear in one location in some of the quires and in another location in other quires, and therefore the total number of manuscripts that display quire signatures and their total per zone are smaller than the totals received by counting them according to the location of the signatures. Because the percentages relate to the number of manuscripts in the corpus, the total of the percentages exceeds 100.

(1) Quire signatures generally   (2) Signatures at the end of the quire (3) Signatures heading the quires (4) Signatures heading and ending the quires (5) Quires signatures in Arabic words or numerals (6) Signatures at the head of a quire and at the end of the preceding quire (counter signatures) (7) Bifiolium signatures (8) Leaf signatures

number of manuscripts (disregarding multiple hands)   % percentage of the regional corpus

Zone	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	5 #	5 %	6 #	6 %	7 #	7 %	8 #	8 %	Total in corpus
Spain	128	27	30	6	25	5	76	16	2	0	1	0	1	0	16	3	**472**
Ashkenaz	9	3	6	2	0	0	1	0	0	0	2	1	4	1	3	1	**294**
Italy	318	45	77	11	32	5	219	31	1	0	3	0	2	0	10	1	**706**
Byzantium	13	7	2	1	4	2	6	3	0	0	2	1	0	0	0	0	**188**
Orient	140	62	10	4	112	50	32	14	61	27	0	0	7	3	0	0	**225**
Yemen	86	89	4	4	31	32	54	56	6	6	0	0	0	0	1	1	**97**
Doubtful	4	20	2	10	2	10	0	0	0	0	0	0	0	0	0	0	**19**
Total	698	35	131	7	206	10	388	19	70	3	8	0	14	1	30	1	**2001**

Table 22: Distribution of markings of middle quire openings

Zone	Period	Manuscripts
North Africa	1001–1100	1[80]
	1301–1400	2
	1401–1500	1
Orient	901–1000	4
	1001–1100	4
	1101–1200	4
	1201–1300	1
	1301–1400	10
	1401–1500	14
Yemen	1101–1200	1
	1201–1300	1
	1301–1400	20
	1401–1500	30
Total		92[81]

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[80] One manuscript where the marking appears in each of its four copyists' section is MS St. Petersburg, Евр II B 124, the earliest codex that with certainty was produced outside of the Middle East and the oldest to survive from the zones of Sefardic bookmaking. As far as can be made out of the damaged and smeared colophon it contains, the manuscript was written in Kairouan (Tunisia) during the fifth century of the fifth millennium, i.e. between 941-1039. For a detailed description of the codex, see *Codices hebraicis*, Part II, ms.29.

[81] Two additional manuscripts may be included in this statistic, one from Byzantium and the other from Italy. In both, catchwords were written also at the end of the first half of the quires, i.e. in the right hand page of the centre opening (see above, n. 22), perhaps in order to thus mark the quire openings in a different manner from that practiced in Muslim lands. In the third manuscript mentioned *ibid*., written in the Orient in 1397, the centre opening of the quire was marked according to the Oriental custom (the marking appears only in one corner of the opening – the lower right hand corner).

Chapter 6: The scaffolding of copying – The architectural disposition of the copied text and its techniques

After the quires were constructed, the copyist could seemingly have begun copying the text or texts, whether they were commissioned or for personal use. But it was first necessary to select the architectural plan for the disposition of the copied text and to rule the horizontal and vertical bounding lines for the written space according to this plan. Doing so ensured the adequate regularity of straight lines and identical margins, so as to produce uniform and well-ordered areas for text on the writing surfaces, and also ensured an aesthetically pleasing layout and uniform mise-en-page for the entire manuscript (or for each treatise) by establishing the relationship between the written and empty space of the page, or more precisely, the relationship to the symmetrical arrangement of text in each of the book's openings. The ruled lines of the manuscript served as an indispensable scaffolding for any regular and aesthetical copying and for the uniform disposition of the text, the interlinear spaces, the columns, and the layout of multi-layer texts (such as the deployment of a core text accompanied by a translation, commentaries, or annotations). A written page was made to render a meaningful message not only through the graphic embodiment of the discourse, but also by its outline of the text, its structure and architecture and the visual configuration of the texture of the writing in the page of the book opening, all of which carried semiotic meaning.[1] The visual appearance of a block (or blocks) of writing on the page disclosed to the viewer its textual genre – Bible, biblical text with commentary, maḥzor or prayer book, poetry, science, grammar or lexicography – even without taking the trouble to read the contents or when observed from a distance that prevents the possibility of deciphering it. This is because each of these genres, in every geo-cultural zone, was shaped according to conventional and functional layouts and copying outlines guided by ruled lines, some patterns extremely complex as in the oversize parchment manuscripts produced in France and Germany. The nature and function of the text, therefore, determined its architectural disposition, ruling and its execution methods;

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[1] J.P. Gumbert, '"Typography" in the Manuscript Book', *Journal of the Printing Historical Society*, 22 (1993), pp. 5–28.

however, once the ruling conventions were consolidated, they presumably influenced the layout of the various textual genres, due to the regularity of book production. Ruling guided the regularity of writing in even and straight lines from antiquity in the Middle East and in the Mediterranean basin, as is clearly evident in Ancient Near Eastern cuneiform clay tablets in Sumerian, Akkadian and Babylonian, and in other ancient inscriptions from the Mediterranean region, in which the "rulings" were engraved as furrows, or in relief.[2] The Judean Desert Scrolls were also ruled by hard point and the Talmudic law requires, according to earlier Tannaitic (post-biblical) sources, that Tora Scrolls should be ruled.[3] In a considerable number of manuscripts, part of which display a vulgar appearance, no ruling is visible; or, more frequently, they only have vertical bounding lines, or frame rulings (sometimes without a bottom line, resembling a portal ruling) in which the text was copied, but without any horizontal ruled lines. Indeed, when the written lines do not correspond one to another on the two sides of the folio and their number is not identical, one can infer that no horizontal lines were ruled. [4] Most of these "sloppy" manuscripts were written on paper in the Orient in early times; yet part of them was later produced in Europe by copyists transcribing texts for their own use. It is no wonder that so many paper manuscripts, especially those produced for self-consumption, were ruled in a reduced manner. Apparently, ruling required proficiency and time input, and its cost in the calculation of commissioned books constituted a considerable part of production expenses. As mentioned above in chapter 2, a unique document from late fourteenth century Italy attests to the costs of

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[2] For the engraved ruling of Sumerian clay tablets of the UR II period (2000 B.C.E), see e.g., the plates presented in J.S. Cooper, *The Curse of Agade*, Baltimore–London 1983. For ruling relief lines, see for example the large Linear B inscription discovered in Crete: A.J. Evans, *Scripta Minoa*, vol. 2 (The Archives of Knossos, Clay Tables Inscribed in Linear Script B, ed. J.L. Myres), Oxford 1951, pl. 87. This tablet is reproduced also in *Encyclopedia Biblica*, vol. 4, Jerusalem 1962, p. 339.

[3] As cited in the Jerusalem Talmud, Megilla 1:22, 71b: הלכה למשה מסיני שיהו כותבין בעורות וכותבין בדיו ומסרגלין בקנה וכורכין בשיער וטולין במטלית ודובקין בדבק ותופרין בגידין<את היריעות> (MS Leiden, Hebrew Language Academy edition, [in the *Ma'agarim* website of the Academy]). See also ibid. and in the corresponding passage in the Babylonian Talmud, the allusion to the requirement to rule the scroll of Esther *ke-'amita shel Tora* (=according to the truth that is the Tora); See also also Maimonides׳ summary of the issue in the *Mishne Tora*, The Laws of Phylacteries and Mezuzah and the Tora Scroll, 1:12: הלכה למשה מסיני שאין כותבין ספר תורה ולא מזוזה אלא בשרטוט.

[4] The lack of ruled horizontal lines has been noted in only 3% of parchment manuscripts before 1500 C.E., as opposed to 11% of paper manuscripts (not taking into account fragmented Oriental manuscripts). The lowest proportion of manuscripts lacking rulings, both on paper and on parchment, is found in Yemen.

the ruling of a Hebrew paper manuscript (the ruling of which is less complicated than that of parchment), in relation to the other book production costs.[5]

This document is important not only for its evidence about the relative costs of ruling, but because the specification of the costs implies that the ruling was handed over to be executed elsewhere. In the section below dealing with ink ruling techniques in fifteenth century Italian manuscripts, documentary evidence and codicological proofs are adduced to show that in Italy copyists used quires that had been ruled beforehand, – apparently by a mechanical mass-produced process – which they purchased at stationery stores. Careful scrutiny of parchment manuscripts in which the ruling is easily observable and which were produced in other regions, but also in Italy in periods predating this development, suggests that the copyists themselves executed the ruling of the bifolia or the folios of the quires. This can be deduced from the many modifications made to the ruling patterns, corrections (a double ruling correcting lines or a column of prickings), and adaptations of outline of the rulings to the texts within a single manuscript. However, such minute scrutiny also furnishes proofs that scribes did in fact use quires that had been pre-ruled for the copying of a text different from that which was actually copied in it. This can be deduced, for example, from manuscripts in which two ruled columns were converted into one, or that had a few unused lines ruled in the upper and lower margins (presumably to guide the copying of the Masora in biblical texts) but which were not used, as well as from copies in which the scribe expanded the written lines beyond their ruled frame line.[6]

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[5] In MS Moscow, RSL Guenzburg Collection 606, fols. 27-90, copied in 1393 by Avraham <ben Yitsḥaq> HaYerushalmi 'Asir ha-Tiqva for Ya'aqov ben Shemu'el Temlin. At the end of the copy, as previously noted, the scribe itemised the production costs of the paper manuscript ‎<‎הנייר בי״א דינ׳>ר>, ‎והשירטוט כ״ד דינ׳<ר>‎, ‎והכתיבה ד׳ דוקט ומ״ה דינ׳; ‎סך הכל ה׳ דוקט; see above, chapter 2, in the text referenced by notes 188-189. According to this evidence, the cost of ruling – which appears not have been executed by the scribe himself, or else there would have been no need to note its price – was twice as high as that of the paper. The copyist's own fee was, of course, the most costly part of the investment. Access to the Moscow manuscripts has allowed the question of the correct dating of the colophon to be resolved. See M. Beit-Arié, 'Hebrew Manuscripts Copied in Jerusalem before the Ottoman Conquest' in *Jerusalem in the Middle Ages: Selected Papers*, ed. B.Z. Kedar, Jerusalem 1979 (in Hebrew), p. 267, n. 76.

[6] For example, MS Paris Hébreu 347, written in Rome in a Sefardic script in 1323, was ruled uniformly; however, until fol. 224 the scribe's writing adhered to the bounding line demarcating the width of the ruling, but after fol. 225 and until the end of the copying (fol. 282), he expanded the written area by beginning the lines (on both sides of the folio) about half a centimetre before the vertical bounding line. See *Manuscrits médiévaux*, I, 32.

It should further be mentioned that in some dated and vocalised biblical or liturgical manuscripts – especially from Ashkenazic zones – one finds additional auxiliary rulings to assist the writing of the vocalisation marks in a uniform manner and at a regular distance from the base of the letters. Since vocalisation was usually added by a vocaliser and only occasionally by the copyist, it appears that this extra ruled line was added by the vocaliser at his initiative.

Ruling patterns

Before presenting the ruling techniques and their historical vicissitudes as well as the ruling tools and manner of implementation, it should be pointed out that it is possible to discern ruling layouts that are characteristic of or conventionally used in this or that region, some of which were apparently influenced by the ruling instruments and techniques. Such patterns are distinguishable by the number of vertical lines added (not necessarily symmetrically) to the lines imposing a boundary for the columns, for a variety of needs – not necessarily functional – and by the horizontal ruling lines in the upper and bottom margins. The ruling patterns built of horizontal and vertical lines are classifiable according to form and quantifiable measures, and indeed some of the methods for formulaic and typological documentation of ruling patterns and layouts of textual disposition in the copying of manuscripts have been long ago proposed in the research on Greek manuscripts.[7]

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[7] On attempts to create formulaic classifications of ruling patterns, see K. Lake & S. Lake, *Dated Greek Minuscule Manuscripts to the Year 1200*, vol. 1, Boston 1934, pp. 1-6; *Indices*, Boston 1945, pp. 121-134; J. Leroy, *Les types de réglures des manuscrits grecs*, Paris 1976; J.-H. Sautel, *Répertoire de réglures dans les manuscrits grecs sur parchemin: base de donées etablie à l'aide du fichier Leroy et des catalogues récents*, Turnhout 1995 (Bibliologia, 13) [Maniaci pointed out the limitations of Leroi's classification and its unsuitability to Latin manuscripts, *Archeologia*, pp. 90-91]; D. Muzerelle, 'Pour décrire les schémas de réglure: Une méthode de notation symbolique applicable aux manuscrits latins (et autres)', *Quinio*, 1 (1999), pp. 123-170. Muzerelle's codification system using symbols - *Analyse de schémas de réglure de manuscrits Latins, grecs et Hébreu* – is also presented on the website http://www.palaeographia.org/muzerelle/analyse.htm. In the meantime Muzerelle has also completed an experimental version of an online tool (called mastara) which draws ruling patterns according to the data provided by those who use his formula. See http://www.palaeographia.org/muzerelle/mastara.htm. He developed a similar application for a corpus of rulings of Hebrew manuscripts assembled and classified by Michelle Dukan according to her method (below, at the bottom of this note). See http://www.palaeographia.org/muzerelle/hébreux.htm, and also for other methods for classifying rulings

The dynamic ruling, the changeable layout, the grid of the ruling and secondary rulings

The second half of the thirteenth century onward, especially in Germany and Northern France, saw the development of several textual genres (especially biblical books with commentaries, and halakhic books) of complex structure, which integrated, merge, or linked multiple layers of texts, or combine a core text with its commentaries, annotations, or glosses.[8] A uniform outline and regular ruling pattern were not suited to the development of the trend by scribes and copyists to render structural transparency to the entirety of the copied texts by visual and graphic means.[9] To reflect the layers' relations to each other and especially to the core text, these texts usually deployed several modes of script of different sizes and densities. Such layered copying required frequent modifications of the ruling pattern, often from one page to the next, according to the changing volume of secondary texts that surrounded the core text on a particular page or that accompanied it in the margins or in parallel columns.[10] Layered copying are therefore dynamic copying, since the textual layout changes within them from one page to the next. Was the entire ruling pattern indeed modified on each page to accommodate the data of the layered text? At one time I believed this to be the case; however a more thorough examination of a few dozen layered manuscripts written in Ashkenaz on parchment and ruled by hard point illuminated the fact that essentially the grid – and usually also the disposition of the core text – remained permanent and uniform in most multi-layered works, and only vertical lines in the body text (in halakhic corpuses), which demarcate the boundaries of the narrow columns and the

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in Greek and Humanist manuscripts. See also, P. Canart, 'Un X qui risque d'être un x: réflections sur la codification d'un type de réglure', *Gazette du livre médiéval*, 44 (2004), p. 53-59. Michelle Dukan has proposed a classification method for ruling patterns in the dated Hebrew manuscripts included in *Manuscrits médiévaux*. See M. Dukan, *La réglure des manuscrits hébreux au Moyen Age*, vols. 1-2, Paris 1988.

[8] G. Powitz has proposed five types of layout of annotated Latin manuscripts: G. Powitz, 'Text und Kommentar im Buch des 15. Jahrhunderts', in *Buch und Text im 15. Jahrhundert / Book and Text in the Fifteenth Century*: *Proceedings of a Conference held in the Herzog August Bibliothek Wolfenbüttel, March 1-3 1978*, ed. L. Hellinga & H. Härtel (Wolfenbütteler Abhandlungen zur Renaissanceforschung, 2), Hamburg 1981, pp. 35-54. For the terminology used to describe the layouts of commentated texts, which includes the typology of the layout types, see J.-H. Sautel, 'Essai de terminologie de la mise en page des manuscrits à commentaire', *Gazette du livre médiéval*, 35 (1999), pp. 17-31. Terms relating to the glosses interpolated into the annotated text are given by Gumbert, *Words for Codices*, sections 334.16-334.0, and his classification of glossed Bibles in his articles 'Bible Glosses' and 'Gilbert's Gloss'.
[9] See below, chapter 8.
[10] See Beit-Arié, *East and West*, pp. 83-99, idem, *Unveiled Faces*, pp. 24-25.

'windows' in which glosses or scholia were incorporated or of the boundaries of the columns of marginal annotation (especially in biblical manuscripts) were added by plummet. We shall see below, in the detailed descriptions of the ruling instruments, that these auxiliary rulings were ruled by plummet, allowing comfortable use of each side of the folio independently,[11] frequently, and flexibly according to the dimensions of the elements of the composite texts. Just as the regular grid was adapted to service the layered text in these Hebrew manuscripts, most of which were manufactured in the he Ashkenazic zones at the turn of the thirteenth century[12] and fourteenth centuries, the same occurred in the early stage of development of the layout of Latin glossed Bibles, which predate the layered Hebrew manuscripts – in the manuscripts of the *Glossa Ordinaria* from the early twelfth century. In glossed Bibles of this kind there was a standard and rigid outline of the column of biblical text, with a uniform number of lines and uniform line spacing in each manuscript.[13]

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[11] We shall see below that this may be the reason why the Hebrew copyists adopted the plummet (especially in France and Germany) after a long period in which this ruling instrument was rejected, presumably because of the psychological effect of its being disqualified for ruling Tora scrolls.

[12] A much earlier example, predating the use of plummet, for complex dynamic ruling may be seen in MS Parma Parm. 2574 (De-Rossi Catalogue, 159, Richler and Beit-Arié Catalogue 1053), Vitry Maḥzor written by <Yitsḥaq ben Netani'el?> (acrostic on fol. 37r) in France during the second half of the 12th century or beginning of the 13th. On many pages, and consecutively in the first thirteen pages, the secondary texts were written in a minute script and interpolated as windows in the main text. The ruling for the copying of the main text was guided by pricking of the frame in the corners of the written area only and was executed by hard point, apparently for the frame alone. Thus, the dynamic layout was made possible in hard point rulings for a bloc of the written area, as was the flexibility of copying within its boundaries (indeed, the written lines of the same size sometimes do not overlap with each other).
An interesting example for adapting hard point ruling to a complex layout is found in MS Parma Parm. 3081 (Richler and Beit- Arié Catalogue 58), which was produced apparently in France in the late 13th century. This manuscript contains a copy of the Pentateuch with Onkelos' translation, verse by verse, the *Haftarot*, the Five Scrolls and the Book of Job. In the outer and inner margins of the Pentateuch and the Five Scrolls, Rashi's commentary was copied in a small semi-cursive script. The quire's bifolia were ruled by hard point. In many of them, there were no individual rulings made for each written line of the marginal commentary, but every alternate second line was ruled, and the copyist compressed three written lines into each such double line.

[13] See Gumbert, 'Bible Glosses', pp. 7-13; idem, 'Gilbert's Gloss', pp. 51-52.

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Ruling therefore served as an architectural plan for the uniform design of the written areas and their disposition on the page or in a book's opening over two pages, and as guidelines for the regular copying of single layered texts, and to a great extent also of multi-layered texts. A multitude of various and complex instruments, techniques and systems served for ruling manuscripts in the Middle Ages, which are sometimes difficult to reveal with certainty.[14] And yet, the variety of ruling methods may be

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[14] Talmudic and medieval sources referring to ruling instruments have been assembled by Löw, *Graphische Requisiten*; Blau, *Althebräischen Buchwesen*; see also the plentiful Talmudic material collected by S. Krauss, *Talmudische Archäologie*, vol. 3, Leipzig 1913, pp. 131-198, in a chapter devoted to scripts and bookcraft. The scribe's instruments were not described in medieval Jewish literature, but mention should be made of the statements in *Sefer Ḥasidim* regarding the impropriety of using scribal tools for puncturing a cyst (*Sefer ha-Ḥasidim*, passage 1755, p. 419: לא יפתח אבעבועות להוציא הליחה לא בקולמוס ולא במרצע ולא במחט המיוחד לספרים, see also Rashi's gloss of the word קיסם in B. Shabbat 11b in his commentary on the *baraita* <...> ולא נגר בקיסם שבאזנו, לא יצא החייט במחטו >, where he likens this tool to a scribe's ruler: קיסם ארוך ושוה כעין סרגלא שמשרטטין בה ספרים שקורין ויר״א בלע״יז ובו משוין את הנסרים כדרך נגרים שלנו משוים בנטיית קו (cited by Löw, ibid., I, p. 239, n. 24.) Also noteworthy is Rashi's comment, in B. Sukkah 32a, lemma כהימנק (אמר רב פפא דעביד כהימנק) (in relation to a *lulav* [palm frond] with a truncated top פויצפור״יר של ברזל של סופרים שיש לו שני ראשים וראשו אי׳ מפוצל, likening it to an iron scribal instrument with a split head. According to Darmsteter and Blondheim, who were translated and adapted by Catane, *Gloses*, p. 52, no. 801 פוינטו״יר <probably according to the manuscripts they used, and indeed thus in most manuscripts> this was a small instrument with two points with which a double line was ruled on parchment. Their hypothesis about the use of the instrument (the '*misrat*' in Catane's fitting Hebrew translation), for ruling double lines, is improbable, based on our knowledge of ruling methods. Its seems that the instrument in question is none other than an instrument for making the prickings that guided the rulings, *punctorium* in Latin – a compass, which according to an illustration inside an historiated initial of a Latin manuscript written in France in the 12th century, did have indeed one double leg, as Rashi aptly described, and also used the correct term for it. The illustration can be seen in Bischoff, *Latin*

classified according to a few general modes. The main methods may be differentiated according to the ruling instruments, their modes of execution and the frequency of their direct application on the quire folios or bifolia. Marilena Maniaci has recently pointed out the justifiable need, when classifying rulings, to distinguish between a factual chacterisation, which is descriptive of what the observer of the manuscript perceives, and a deductive chacterisation, which deduces and reconstructs what action the craftsman performed or what the codicologist assumes he did.[15] Peter Gumbert, in response to Maniaci's study of ruling terminology proposed that we distinguish between four aspects of describing and cauterising rulings; *technique* – 'the technical means used to effect the ruling' <their instruments>; *pattern* – 'the spatial arrangement of the ruling on the page' and *type* – 'a class of ruling patterns that are identical in the relative position'; *system* – 'the way furrows and ridges in primary and secondary rulings are arranged in a blind-ruled quire' (ruled by hard point); and *method* – 'the <deduced> succession of operations used to effect the ruling.[16]

According to Maniaci's proposal (and disregarding Gumbert's use of the term 'system'), one can indeed divide the modes of classifying Hebrew ruling methods into two types, one relating to the visual appearance of the ruling as it is perceived today,

Palaeography, pl. 14, and see ibid., pp. 18-19 (it was not included in the German original, B. Bischoff, *Paläographie des römischen Altertums und des abendländischen Mittelalters*, Berlin 1979, and was first presented in the French translation of Bischoff's book*, Paléographie de l'antiquité romaine et du Moyen Âge occidental*, tr. H. Atsma & J. Vezin, Paris 1985, pl. 14).

For a very detailed summary of the halakhic sources – Mishnaic, talmudic, Geonic, and commentaries by the Rishonim – regarding the obligation to rule Tora scrolls and the implications for holy books in general, as well as for deeds and letters, see Danzig, 'Ruling', pp. 283-359. See also ibid., p. 311 for the interpretation of the scribal instrument אטבא דספרי mentioned in the Talmud (B Shabbat 98b). Danzig refers also to the explication that the instrument (apparently a compass) was used for making the prickings guiding the ruling of the lines, but this not the descriptiopn of Rashi (see above, chapter 4, appendix. n. 8). On the scribal instruments according to the books of two Italian calligraphic artists, printed in 1530 and 1540, which do not necessarily reflect the writing traditions and instruments of the previous centuries, see J.P. Gumbert, 'Les outils du copiste', *Gazette du livre médiéval*, 32 (1998), pp. 1-7; R.A. Rosenfeld, 'Using Illustration of Tools from 16th-Century Manuals', ibid, 33 (1998), pp. 42-43; J.P. Gumbert, 'On "outils" and "vernice"', ibid, 33 (1998), p. 44-45. This article should be consulted in its internet version, which includes Rosenfeld's reservations and Gumbert's response in the article text (http://palaeographia.org/outils/outils.htm). A summary survey of the study of ruling (and pricking) in Greek and Latin manuscripts, accompanied by a vast bibliography appears in Maniaci, *Archeologia*, pp. 82-99 and in the bibliography nos. 759-792. The English terms and the drawings that have been proposed experimentally by Gumbert, *Words for Codices*, pp. 15-20 are illuminating. Highly valuable also are the drafts of a guide to codicology that he began to compose in 1991 when he was a fellow in the comparative codicology group in the Institute for Advanced Studies in the Hebrew University of Jerusalem. See also, Agati, *Introduzione alla codicologia*, pp. 179-219; idem, *Codicologia comparata*, pp. 181-215.

15 M. Maniaci, 'Verso una nuova riflessione sul lessico codicologico', *Gazette du livre médiéval*, 51 (2007), p. 10.

16 J.P. Gumbert, 'Old and New Style: Terminology of Ruling Systems and Methods', *Gazette du livre* médiéval, 52-53 (2008), pp. 25-26.

and the second relating to assumed methods of ruling. The first division, according to the appearance of the ruling, distinguishes between colourless relief rulings, also called blind rulings, although these rulings too are visible to the trained eye, and coloured rulings.[17] Relief ruling was made by a sharp instrument – such as a knife or a stylus, and according to Arabic sources even fingernails – that left furrows and ridges on the quire's pages.[18] Alternatively, relief rulings were executed by a ruling board with on its surface a pattern of horizontal lines and verticals for the margins, which - in the Orient, were made of threads or strings, and in the Occident - of rigid cords. The grid pattern was thus impressed onto the writing surface (paper in particular) by pressing or rubbing. The shared feature of the rulings in this group is the lack of colour and the possibility of reduced presence of the scaffolding of the copying as well as the time-saving process by which more than a page or one side of an unfolded bifolium is ruled in one go: with one movement furrows are created on the ruled or impressed side, with raised reliefs on the other side of the folio or the unfolded bifolium, which may leave identical impression marks on each folio (or group of lolios) or on a bifolium or group of adjacent bifolia.

Coloured rulings, which were adopted by the Hebrew copyists at a later stage compared to their usage by Latin copyists, were made by a metallic plummet made mostly of lead, which left markings in shades of black, brown, or in a pale ink, sometimes pinkish in colour – a technique which is still poorly understood. The coloured rulings are easily visible, even though, with time, the pigments of the metallic plummet, which were not meant to be erased, disappeared to a lesser or larger degree from many pages leaving only feeble impressions of furrows. Coloured rulings were made on each side of the folio or of the unfolded bifolium except for in a few regions, especially in Italy, where particularly during the first period of its usage the plummet had a double function, both as an instrument for making coloured rulings, and for making economical relief rulings on the back of the ruled side.

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17 This division was suggested by Derolez, *Codicologie*, vol. 1, pp. 72-78.

18 See Rosenthal, *Muslim Scholarship*, p. 11. The source is in the chapter on the copying craft from a 16th century treaties, but it is very similar to a chapter in a work from 1273. Note also the *baraita* in the Jerusalem Talmud on the ruling of a Tora scroll with a reed (above n. 3).

The various ruling techniques can otherwise be classified from the viewpoint of the ruling guidance method,[19] for a complex and uniform layout cannot be drawn without using some kind of scaffolding to guide the ruling. One can differentiate between rulings guided by prickings on the margin and rulings guided by a variety of ruling templates. Guiding pricks, which were used on most parchment manuscripts in all zones, were made on the margins of pages or unfolded bifolia, usually by pricking the entire quire in one go with tiny pricks that were apparently made by an awl or a knife or some other sharp and rigid instrument. These imaginal pricks – which marked the placement of the horizontal (and the vertical boundary) lines, and thus determined their spacing and as a result also their number and disposition – guided the craftsman who ruled the horizontal and vertical lines aided by a ruler that was positioned to connect the holes. The rulings that were not guided by prickings also had to be guided by some method. It stands to reason, and careful scrutiny of the appearance of such rulings also indicates, that they were guided by various ruling instruments, whose nature we have no clear image for the most part. Apparently, they were some sort of templates, models, ridged boards or ruling frames that guided the ruling when placed on the page; alternately, the ruling was made by impressing boards of this kind or perhaps with the use of a ruling instrument like the rakes used for ruling staves for musical notation.[20] Both relief rulings and coloured rulings could have been made by hand guided or 'mechanically' guided methods. The use of frames or ruling boards produced maximum uniformity and regularity of the copying outlines, while ruling by guiding prickings on the margins and a ruler was susceptible to inaccuracies, non-uniformities, and skewing, and often one notices in them corrections in the form of double prickings and double rulings.

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[19] See also my introduction to Sefer Pitron Tora: *a Collection of Midrashim and interpretations: Facsimile Edition of a Manuscript of The Jewish National and University Library Heb. 4° 5767*, Jerusalem 1995, pp. 18-34 (in Hebrew).

[20] As Gumbert noticed among manuscripts from the Netherlands, which were ruled in ink; see Gumbert, 'Ruling by Rake'. Such rulings of groups of lines that were clearly made in one go have not yet been observed among Hebrew manuscripts. In addition to the technical possibility of ruling horizontal lines by plummet on each page with the guiding of full marginal prickings, one should note Muzerelle's suggestion and reconstruction of a method of ruling exclusively with a moving ruler whose width is adjusted to the desired spacing between lines, See D. Muzerelle, 'Un instrument de réglure inattendu: la règle', *Gazette du livre médiéval*, 52-53 (2008), pp. 79-85.

Generally speaking, relief rulings were the first to be used by Jewish copyists, while the coloured rulings came to be used later in the Askhenazic zones and afterwards in Italy.

a. Pricking[21]

Pricking, as a matter of fact, is an inseparable part of the ruling. Although it is executed first, it is integral to the ruling and both should be seen as a single step of the process. Prickings are no less than the scaffolding of the scaffolding of the copying. Their purpose is to mark the positions of the horizontal and vertical lines and guide their ruling. The layout of the pricking is determined by the ruling method. In the detailed account (below) of ruling methods guided by pricking, their corresponding pricking methods will be included. Nevertheless, pricking deserves its own detailed description, so that its manner of application can be considered from an overall point of view. Full prickings were used in almost all parchment manuscripts ruled by hard point or by plummet in all zones in all periods. Only in the Middle East were guiding prickings also used in early paper codices, which were ruled in hard point in the same manner in which tenth century parchment manuscripts were ruled. This shared method of ruling parchment and paper survived especially in eleventh century manuscripts – during the first one hundred years of production of the paper codex in the Orient and at the turn of the twelfth century. The ruling technique in Oriental paper codices changed quickly and radically during the first third of the twelfth century at the very latest, and it was no longer guided by prickings but a ruling board.

The custom of marking the placement of lines in order to guide the rulings is ancient, and it predates the diffusion of the codex among the Jews. It has been already in use in the ruling of the leather sheets of scrolls found in the Dead Sea area and Judaean desert, as Milik already noted in his discussion of the fragment 4QSdal,[22] and as Emanuel Tov noticed in scores of scrolls

[21] Pricking in English (verb and noun); in French – piqûre; in Italian – foratura (See Gumbert, *Words for Codices*, p. 15).

[22] J.T. Milik, 'Numeration des feuilles des rouleaux dans la scriptorium de Qumran', *Semitica,* 27 (1977), p. 76, Pl. X.

and surveyed and described in great detail.[23] In the fifty-six (or fifty-seven) scrolls in which such markings are visible, lines were not marked by prickings as in medieval times but by rows of ink dots or sometimes pen strokes. As Tov has remarked, such guiding dots were noted by Turner in a number of early Greek papyri.

All early parchment manuscripts in the Orient and Occident, as well as Sefardic parchment manuscripts before the end of the middle Ages, and Italian manuscripts until the beginning of the fifteenth century, were fully ruled by hard point, and in ruling is composed of horizontal lines and vertical boundary lines. Also fully ruled were parchment manuscripts ruled by plummet or engraving plummet in the Ashkenazic zone beginning in the final third of the thirteenth century as were a few Italian ones. The ruling of the horizontal lines was guided by rows of tiny pricks or miniature slots along the margins, which ensured the regularity of the written lines and uniformity of the interlinear spaces. The ruling of the vertical bounding lines demarcating the width of written area was guided by single pricks or slots in the upper and lower margins. The rows of prickings in the outer margins as well as the single prickings in the upper and lower margins were destined to disappear partially or completely over time due to trimming of the margins at successive rebinding. This was not true of the rows of prickings in the inner margins in those manuscripts in which inner margins were pricked, which for the most part have survived. The partial rulings that sometimes appear in sloppy manuscripts, that did not included horizontal lines – but only frame or portal rulings, or vertical marginal lines only – were guided by single prickings at the edges of the upper and lower margins (four in total), like their prickings in complex rulings.

Examination of the prickings or slots, which are best observed with a magnifying glass, reveals a number of basic common shapes, such as a triangle or ellipse, which correspond to the instrument used to make the pricking – a blade, awl, or sharp instrument with a triangular point. The curved pathway of many columns of prickings attest to the use of compass, which is mentioned in the literature, although the latter was likely to have been used only to mark the prickings, not for the pricking action.[24]

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[23] See Tov, *Scribal Practices*, pp. 61-68; and see plates 2a, 10a, and 15, where the markings are clear.

[24] For the enumeration of the various instruments, the existence of some of which is surmised, see Agati, *Introduzione all codicologia*, pp. 179-180. The copyist's instruments enumerated in a lexicon from the end of the 11th century by an English scholar named Alexander Neckham included a quill, stylus, knife

The widely held assumption, until late, that a roulette – a serrated wheel – was used to make the prickings for the horizontal lines (an instrument that if indeed used for mechanical pricking could have – like the use of a compass – explained the curvature of the column of prickings in many manuscripts) has been recently thoroughly disproved.[25] The assumption that a compass (or a roulette) was used might explain how the regularity interlinear spaces between the prickings was achieved, but cannot explain how in some of the manuscripts such straight columns of prickings were formed, nor how the regularity of the location of the prickings was achieved. The pricking, which was meant to guide the uniformity of the ruling and the regularity of the copying, also had to be uniform and regular and therefore be guided in some manner. The scaffolding for the copying's scaffolding also required a guiding architectural plan. Indeed, in several Hebrew manuscripts produced in Germany one can see vertically ruled lines in the margins along which the columns of prickings were made.[26] It is reasonable to assume that the medieval copyists of all scripts also used some perforated frame that guided the piercings and guaranteed their uniformity in all of the codex's quires.

The shape of the pricks (or small slots), their location and changing dimensions from one folio to the next also attests to the frequency of the pricking and its direction, i.e. how many folios were pricked in one go and what was its direction (from the recto or verso page). It is also possible to see with the naked eye what side the quires were pricked from. Similarly visible is the fact that the dimensions of the pricks become smaller with the direction of the pricking, and that their angles differ. These observations indicate that in the vast majority of Hebrew manuscripts from all zones each quire was pricked while folded in one go, despite the technical difficulty of pricking through multiple parchment folios (usually eight to twelve), because the angles of the pricks and their sizes differ from one quire to the next. It is obvious that pricking

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(for scraping errors), blotting stone (for rubbing), plummet, ruler, and awl for pricking; See Clanchy, *From Memory to Written Record* (above, chapter 1, n. 23), p. 90.

[25] J.A. Dane, 'On the Shadowy Existence of the Medieval Pricking Wheel', *Scriptorium*, 50 (1996), pp. 13-21; D. Muzerelle, 'La machine àrouler… les codicologues!', *Gazette du livre médiéval*, 37 (2000), pp. 18-25; R. A. Rosenfeld, 'Pricking Wheels', ibid., pp. 18-25.

[26] MS Venice, Bib. Marciana Or. 211-214 from 1253; MS Rovigo, Accademia Silvestriana 216 from 1272; MS Parma, Parm. 2924 (De-Rossi Catalogue 60) written in Switzerland in 1279; MS Oxford MS. Opp. 337 (Neubauer Catalogue 884) from 1383; MS Moscow, RSL Guenzburg Collection 182 from 1391. Presumably this practice was followed also in other Ashkenazic manuscripts but remained unobserved. An example of a ruling guiding prickings in an Oriental manuscript is MS San Francisco, Sutro WPA 106, copied in Yemen in 1299.

each folded quire with a single motion would guarantee that the ruling of the bifolia, folios, or pages would be as uniform and identical as possible. The evidence of the shape of the pricks and their changing proportions is reinforced by the evidence of the track made by the columns of prickings. These tracks could be perfectly straight, but frequently they are curved or tend to the right or to the left (the shape of the tracks presumably attests to the quality of the pricking tool and its operation). We can see that this criterion also shows that manuscripts were pricked one quire at a time, because the pricking tracks change from quire to quire. The recently found remains of temporary stitching in quires that were sewn separately (as mentioned in the beginning of chapter 4) may explain how bifolia or folios were pricked in one go. Pricking (and ruling) employing the imposition method, i.e. rulings guided by the pricking of entire parchment sheets prior to folding and trimming into quire bifolia – a method revealed by a few Latin manuscripts – has not yet been identified among Hebrew manuscripts.[27] Only a few of the Hebrew parchment manuscripts were pricked at a different rate than an entirely folded quire and in ways that were remarkably similar to the sophisticated pricking (and ruling) methods discovered in the scriptoria of Latin manuscripts prior to the early tenth century, the earliest periods of extant Hebrew manuscripts or from an adjacent time period.[28] An early example of a manuscript pricked in this manner is a non-colophoned Geniza fragment MS Jerusalem Heb. 4° 577/5.8, in which only the first of each pair of bifolia was pricked (but the pair was ruled together)[29]; another are three paper codices that were produced in Cairo in 1198 by the same copyist for self-consumption, which were pricked for the ruling of horizontal lines in the outer margins

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[27] See A.I. Doyle, 'Further observation on Durham Cathedral Ms. A. IV. 34', in *Varia Codicologica: Essays Presented to G.I. Lieftinck*, ed. J.P. Gumbert & M.J.M. De Haan, vol. 1, Amsterdam 1972, pp. 35ff; L. Gilissen, 'La composition des cahiers, le pliage du parchemin et l'imposition', *Scriptorium,* 26 (1972), pp. 3-33. For a bibliography and comprehensive survey of quires ruled and copied in the imposition method, see P.F.J. Obbema, 'Writing on Uncut Sheets', *Quaerendo,* 8 (1978), pp. 337-354. See also Bozzolo & Ornato, *Codicologie quantitative*, esp. pp. 125-212.

[28] As was revealed by the pioneering and classic studies by Rand, and followed especially by Jones. See esp. L.W. Jones, 'Ancient Prickings in Eight-Century Manuscripts', *Scriptorium*, 15 (1961), pp. 14-22; E.K. Rand, 'Traces de piqûres dans quelques manuscrits du haut Moyen Age', *Comptes rendus des séances de l'Académie des Inscriptions & Belles-lettres*, 1939, pp. 411-431. Other articles by Jones on the topic of pricking are listed by Maniaci, *Archeologia*, nos 761-764.

[29] As observed in Latin manuscripts from the beginning of the 9th century. See E.K. Rand, 'Pricking in Manuscripts of Orléans', *Transactions and Proceedings of the American Philological Association*, 70 (1939), p. 334.

except for in the first folio of each quire.[30] The columns of vertical prickings guiding the horizontal lines were similarly placed. In almost all of the Hebrew parchment manuscripts these columns are located close the edge of the outer margins (and the inner ones – when they too are pricked).

The lack of dated codex findings prior to the tenth century prevent us from learning whether those earlier Hebrew manuscripts were pricked in a different manner than that of Latin manuscripts dating from the fourth through the tenth centuries. At first, the Latin copyists preferred to incorporate the columns of vertical prickings entirely within the area of the written text (or between text columns), and later, from the end of the fifth century the columns were pricked in the margins, at first very close to the written area, but gradually at a greater distance, until by the tenth century and onward, the marginal prickings close to the edges of the pages became the standard placement in Latin manuscripts.[31] A similar development is evidenced in early Greek manuscripts.

Guiding pricking for horizontals ruling: in outer margins only.

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[30] *Codices hebraicis*, Part IV, mss. 96-98.

[31] According to Maniaci's summary of Jones' studies of this issue, Maniaci, *Archeologia*, p. 85 (Regarding the marginal prickings she notes that, aesthetically speaking, they are less attractive than the incorporated prickings, although the prickings incorporated in the written area could interfere with the flow of the writing). At any rate, according to Jones, the incorporation of the vertical prickings into the written area (or between its columns) is characteristic of Latin manuscripts before 800, but it was commonly used in the 4th to 6th centuries. See L.W. Jones, 'Where are the Prickings?', *Transactions and Proceedings of the American Philological Association*, 75 (1944), pp. 71-84. According to Vezin, *Annuaire*, p. 494, the source of this custom may have been Oriental or North African, and it persevered even until the 9th century, especially in northern and northeastern France and Germany, and in Spain until the second half of the 10th century. I have observed vertical prickings placed very close to the written area and sometimes incorporated within it only in one Hebrew manuscript, MS Vatican, Vat. ebr. 66 – the famous manuscript of the *Sifra* with Babylonian vocalization, whose antiquity is beyond doubt. If we apply the criterion of the placement of the prickings in Latin manuscripts to the dating of MS Vatican, this manuscript was produced in the 9th century at the very latest. If so, this would seem to be the earliest Hebrew codex that has survived in its entirety. Such a dating could be disproved by the existence of quire catchwords in MS Vatican. As will be recalled, quire catchwords do not appear in the dated Oriental manuscripts until the beginning of the 11th century (although all the dated manuscripts that have survived before that date were biblical manuscripts, and it may be that their scribes avoided adding even catchwords to the text).
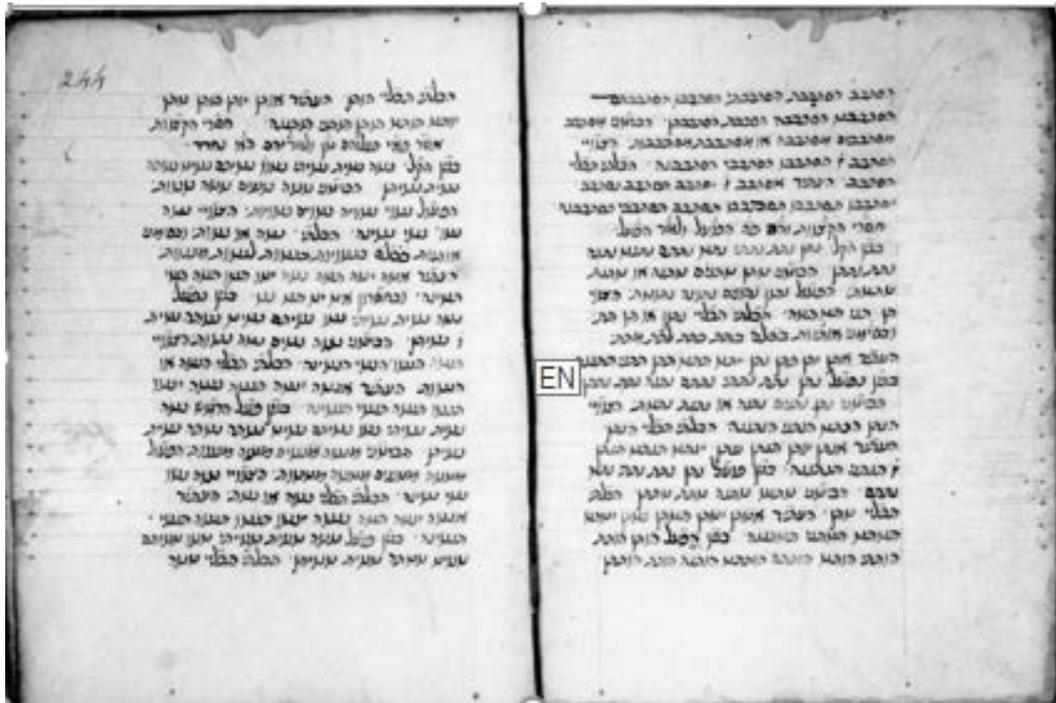
MS Paris, Hébreu 1221, fols. 243v^244r

Guiding pricking for horizontal ruling can be executed by two methods. One implementation is pricking in vertical columns in the outer margins only, or in the outer and inner margins together. When the folded quire folios were pricked in the outer margins only, the ruling unit was an unfolded bifolium (or a number of unfolded bifolia), because ruling the lines had to be executed by laying down a ruler from one prick or slot to the parallel one on the other end of the unfolded bifolium. When the folded quire folios were pricked in the outer and inner margins, the ruling unit was a folio (or several folios) or a page, because the ruling of the lines was guided by parallel prick on each and every page.[32] Selection of the pricking method was most certainly

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[32] Unusual prickings have been found in a large fragment of the Mishna, written apparently in Italy, in the 12th century. The manuscript includes ten whole bifolia and eight fragments that were discovered by Mauro Perani in the bindings of registers in archives in northern Italy (I am grateful to him for drawing my attention to this rare phenomenon). In each bifolium that has survived in its entirety, among the fragments listed below, the outer margins and only one inner margin of the unfolded bifolium's opening was pricked: Modena, Archivio Storico Comunale ebr. fr. 50-56; Modena, Archivio di Stato, ebr. fr. 129.1, 129.2; Modena, Archivio Capitolare, ebr. fr. 55.1, 55.2; Correggio, Archivio Storico Comunale ebr. fr. 37.3, 37.4; Nonatola, Archivio Storico Comunale ebr. fr. 305-309. For a description of the three fragments, see: M. Perani & E. Sagradini, *Talmudic and Midrashic Fragments from the "Italian Genizah": Reunification of the Manuscripts and Catalogue* (Quaderni di *Materia Giudaica*, 1), Florence 2004, pp. 24-28. Could the explanation for the unusual pricking be that the quires were at first pricked on the outer margins only, but that when the bifolia of the oversize manuscript were spread out the copyist's ruler was not long enough to connect the prickings and rule the lines and therefore another column of prickings was added at the quire's opening, splitting the drawing of the ruled lines into two?

derived from the ruling method, and it should not be assumed that the ruling method was derived from the pricking method.

Until the thirteenth century, apart from manuscripts produced in Spain, most Hebrew manuscripts with horizontal rulings guided by prickings were pricked only in their outer margins, and the lines were ruled across the unfolded bifolia with a ruler that was placed from one slot to its parallel slot. Later, in the Middle East,[33] Italy,[34] and Byzantium,[35] pricking was limited to the outer margins only, and the ruling unit was, of course, unfolded bifolium or a group of bifolia. On the other hand, in Spain, France, and Germany, it was customary to make rows of guiding prickings in the inner margins as well. In Spain this was the practice from early times, while in Ashkenaz it became gradually customary only from the thirteenth century onward. The functions of the double pricking in relation to the ruling in these two areas were not merely different but opposed. In both areas the direct ruling unit was the folio or page, but in Spain the double prickings assisted the economical ruling of several folios in one go, while in Ashkenaz it assisted the separate ruling of each and every page.

Guiding pricking for horizontals ruling: in outer and inner margins

This explanation is unlikely because of the simple possibility available to the copyist of later adding an inner pricking when folding the quire for a second time.

[33] Apart from a few manuscripts produced in the Orient by immigrants from the zones of the Sefardic book culture in the late 10th century and early 11th century (*Codices hebraices*, Part I, Hebrew introduction, section on ruling, ibid., Part II, Hebrew introduction, section on pricking and ruling), pricking on both margins is found in a few Oriental manuscripts, all of which are biblical texts which are large relative to the dimensions of most Oriental manuscripts (See Beit-Arié, *Makings*, pp. 116-117) MS St. Petersburg Евр. II B 1548 (undated, but probably from the 10th century); Евр. II B94 (the ruling method, which is unique to the early Sefardic and Maghrebi book culture attests that this manuscript was written by an immigrant from North Africa or Spain, who had already assimilated the Oriental writing type); MS Cambridge T-S A 42.3, a Geniza fragment from 1204; MS Oxford MS. Heb. d. 37, fols. 28-37 (Neubauer and Cowley Catalogue 2603/9), a Geniza fragment of an oblong size.

[34] Besides the manuscripts written in Italy by Ashkenazic or Sefardic immigrants, especially in the 15th century, none of the many manuscripts produced in Italy display double prickings in the margins, with the exception of a few dated and a few undated manuscript whose Italian provenance is not always clear, and even in these the double pricking is partial.

[35] Apart from a few manuscripts that were pricked also in the inner margins. The inner prickings in a fragment of the Pentateuch in MS Oxford MS. Heb. c. 6, fol. 5, written in 1192 apparently in Byzantium (*Codices hebraices*, Part IV, Manuscrit. 89), were not used to guide the lines.

In Spain double pricking served as the standard practice from the beginning of the twelfth century at the latest. Though this practice declined over time, it was practiced , until the end of the Middle Ages. However, it should be emphasized that double prickings do not appear in the earliest dated extant manuscript from the zone of Sefardic book production – i.e. the manuscript with the damaged colophon, which, as far as its legibility allows us to ascertain, was
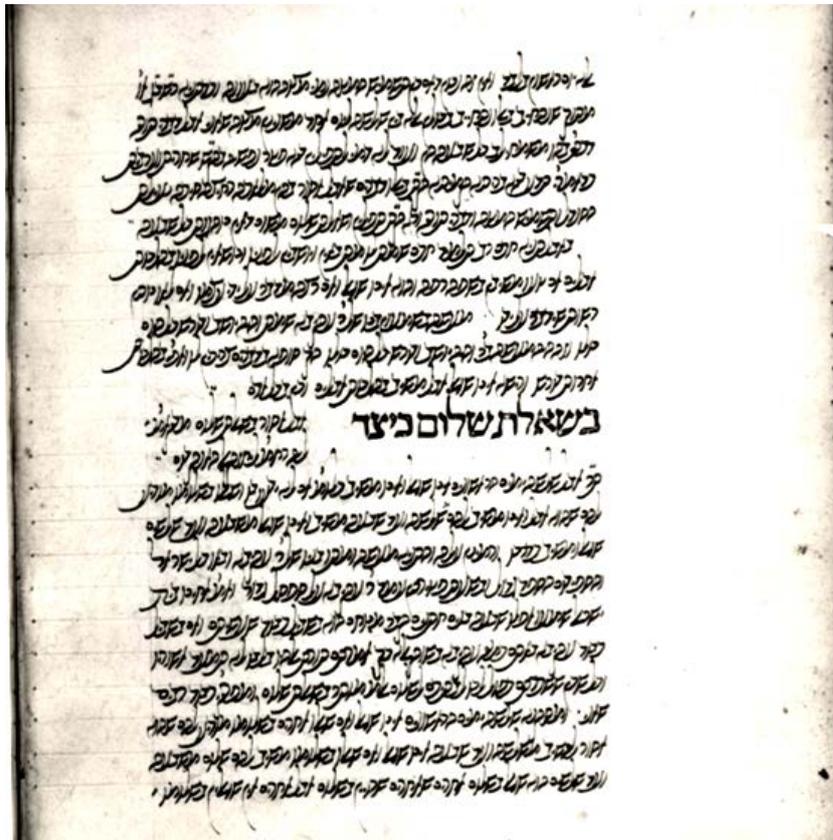
Pricking in the outer and inner margins

written in Kairouan in the eighth century of the fifth millennium, between 941 and 1039.[36] It should nevertheless be noted that even though only the outer margins were pricked in this manuscript, the ruling of two consecutive unfold bifolia in part of its quires already anticipates that unique economical Sefardic method of ruling guided usually by pricking in the outer and inner margins. The earliest surviving parchment manuscript after the Tunisian one was produced in 1123, presumably in North Africa, by a copyist of Libyan origin,[37] and it was pricked in the inner margins as well. From that point onward all Sefardic parchment manuscripts prior to 1270 were pricked on both margins, as dictated by the ruling technique and method. The earliest manuscripts (other than the mentioned early Tunisian one) that was pricked only in the outer margin (and ruled in units of unfolded bifolium) dates from 1271.[38] From that point onward

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[36] *Codices hebraices*, Part II, Manuscrit 29.

[37] Remnants of a Talmudic codex from the Cairo Geniza that were dispersed among the collections in Oxford, Cambridge, and London. See *Codices hebraices*, Part III, ms. 63.

[38] MS Cincinatti, HUC 563.

single margin pricking became customary in many Sefardic manuscripts. Despite the diffusion of the new methods of pricking and ruling, the old technique of double pricking, (derived from the unique ruling method) continued to serve as the main method in Sefardic bookcraft. The new technique of pricking the outer margins only was used in only one third of the parchment manuscripts dated from 1271 until the Spanish expulsion, without taking into account the possibility that additional manuscripts could have been pricked in the outer margins, but that the outer margin did not survive because of the trimming of the margins during the subsequent rebinding of the manuscript.

In the Ashkenazic zones – the German lands and their environment and northern France – a gradual but discernible change occurred in the thirteenth century (especially in its latter third) in regard to the standard placement of the vertical guiding pricking, from single-margin prickings to double-margin prickings. The early manuscripts, produced before the mid-thirteenth century, were pricked in the outer margins only, according to the custom of Latin copyists. This is witnessed in the extant dated Ashkenazic manuscripts before the latter third of the thirteenth century. Indeed, it should be emphasized that these manuscripts, the earliest of which, it will be recalled, is from 1177[39], number no more than twenty-six (and a few of them, were apparently unruled), and if we count the number of scribes represented by this group of manuscripts, the number increases to thirty-seven; however this evidence is supported by a considerable number of datable, although not explicitly dated manuscripts, and their age predating the thirteenth century is patently obvious.[40] One exception among the manuscripts produced in these areas is a biblical manuscript from 1189, formerly kept in the Sassoon collection, purchased by the Valmadonna Trust Library in London (and eventually acquired by the Museum of the Bible in Washington DC, MS GC.MS.000858), which

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[39] This is part of MS Firenze of the Talmud, tractates from the Order of Qodashim, MS Firenze, Bib. Nazionale Magl. II I 7; See *Codices hebraices*, Part IV, Manuscrit. 79.

[40] For example, MS Jerusalem, Avigdor Klagsbald (private), which includes the French Vitry Maḥzor (formerly MS Sassoon 535). According to the calendars included in it it was written in the second quarter of the twelfth century, between 1123/4 and 1154/5 (see above, chapter 2, n. 95); MS Oxford MS. Laud. Or. 326 (Neubauer Catalogue 179); MS Oxford MS. Opp 627 (Neubauer Catalogue 1449); MS Vatican ebr. 113 (Babylonian Talmud, Tractates Ketubot and Nida), and MS New York, MS 8092, the Vitry Maḥzor, ,which according to the inscription written at the margins of the text of the *birkat ha-ḥodesh* (Benediction of the Month, fol. 37r), may have been written in 1204 or at a similar date (See A. Grossman, *Early Sages of France: their lives, leadership and works*, Jerusalem 1995, p. 172, n. 180 [in Hebrew]). A small part of this manuscript was indeed pricked also along the inner margins (see below, n. 44).

is pricked in the outer and inner margins. Apparently, this manuscript ostensibly invalidates the assumption on the uniformity of the scribal partice of Jewish scribes in Europe except for Spain andextra-Spanish Jewish European practice and undermines useful chronological implications of such uniformity. However, due to the Anglo-Norman glosses added by the Masorete, it can be claimed that this unusual manuscript was not written on the European continent (where Latin copyists did not practice double margin pricking), but rather in Norman England, where such pricking did occur among Latin copyists, and therefore it can be surmised that the Jewish scribe prepared the quires for this copying according to local custom.[41]

The addition of a vertical guiding pricking column in the inner margins of the folio to the column in the outer margins of the bifolium in Ashkenaz begins to appear at the very latest at the end of the first third of the thirteenth century. This shift accompanied a more conspicuous technical shift in the method of ruling, as we shall see below – the replacement of stylus with a plummet as a ruling instrument, the change of the ruling unit from a bifolium to a page, and the change in appearance from a blind relief ruling to coloured ruling. These changes were implicated with changes to the method of processing and appearance of the parchment (see above, chapter 3, Ashkenazic parchment). It is quite plausible that the shift to double margin pricking was an inevitable result of the shift to the use of equalised parchment and the practice of plummet ruling on every page separately. Nevertheless, several manuscripts in the early phase of the new practice display a mixture of the old and new methods, and so we find double-margin pricking in manuscripts produced on non-equalised parchment but ruled

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[41] See Beit-Arié, *England*, with addenda and corrigenda in Beit-Arié, *Makings*, pp. 139-141; *Codices hebraicis*, Part IV Manuscrit 85. A support for the hypothesis that it was written in England and that the Hebrew manuscripts produced there used double margin prickings may be supplied by the bifolium with inner margin prickings from a prayerbook that survived as a cover for the front binding board of a Latin Bible originating from the convent in Bury St. Edmunds and which is kept today at Pembroke College in Cambridge. It stands to reason that this prayerbook was used by the Jews of Bury, and this bifolium may have found its way to the convent when the Jews were expelled in 1190. The bifolium was published in M. Abrahams, 'Leaf from an English Siddur of the Twelfth Century', in *Jews' College Jubilee Volumes*, London 1906, pp. 109-113, and it was reprinted with an accompanying codicological and palaeographic analysis by C. Sirat, 'Rapport sur les conférences de paléographie hébraïque médiévale: Un fragment de livre de prières du XIIème siècle', *Annuaire de l'École Pratique des Hautes Études* (1974/1975), pp. 559–574 (on the pricking of this bifolium, see ibid., p. 561). A further support may be offered by MS Oxford, CCC 133, an unusual prayerbook reflecting an extraordinary French rite, which was pricked in both inner and outer margins. This prayerbook was used in England in the late 12th century and it is safe to presume that it was written there. See Beit-Arié, *Makings*, p. 136, n. 68, and p. 138.

in relief on each folio separately, just as eventually manuscripts would be found with coloured rulings, but pricked only in the outer margins. However, such mixing should not come as a surprise in a period of transition. The earliest manuscript in which all the quires were pricked both in the outer and inner margins was formerly kept at the Jewish Theological Seminary in New York,[42] and today is kept in the private collection of David Sofer in London, MSS 1-2. This biblical manuscript, completed in 1264, reflects the earliest extant example of the entirety of the novel production modes of the Franco-German zone: it is written on equalised parchment, features double-margin prickings, and is ruled by plummet page by page. And yet, there is no doubt that the new pricking technique had developed even earlier, at the latest at the end of the first third of the century, because the David Sofer manuscript is preceded by partial implementations of the double-margin pricking: primarily the quires copied by the main scribe – one of two – of MS Munich Cod. Hebr. 5, which was produced in 1232/3 in Germany (the scribe's provenance was in Würzburg).[43] Double margin pricking was also found in a single bifolium of a manuscript produced in 1253/4.[44]

The diffusion of the new custom was also slow during the first half of the latter third of the thirteenth century. In the fifteen years that elapsed since the additional prickings in the inner margins had made a regular appearance in the Franco-German zones, it was implemented in full only in one dated manuscript[45] of the nine that had survived from the period between 1264 and 1280. However the dated manuscripts in our possession

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[42] MS New York, General Theological Seminary, Bible/O.T. Hebrew MS 1264.

[43] On the division of quires between the two scribes, see Beit-Arié, *Makings*, pp. 136, n. 63. According to the unique script and the para-scriptural elements, the same scribe (Shelomo ben Shemu'el of Würzburg) also copied the first three quires of another manuscript, without a colophon – MS Moscow, Guenzburg Collection 615. The quires of MS Moscow were also pricked in both margins, and ruled with a plummet. It can hence be derived that Shelomo ben Shemu'el, who was active at the end of the first third of the 13th century in Germany, is the first copyist among the copyists of the extant dated manuscripts from France and the German Lands (with the exception of England) who used inner and outer margins prickings and ruled with a plummet.

[44] MS London Harley 5648 (Margoliouth Catalogue 518). Of great interest is the pricking in the inner margins of one quire and in several bifolia of the manuscript of the Vitry Maḥzor, MS New York MS 8092 (above, n. 40), all of whose other quires were pricked only on the outer margins. If the date it displays on the margins of the Benediction for the Month was added by its copyist, we have a witness of the secondary use of the double custom as early as 1204! And if the date was added after the time of the manuscript's writing by one of its owners, we can conclude that the manuscript was produced even before. If so, the (hesitant) beginnings of double margin prickings in French and German Hebrew manuscripts might need to be pushed up to the end of the 12th century, and if so, there may not be a particular need to ascribe the inner prickings in of the abovementioned MS Valmadonna-Washington from 1189 to its English provenance.

[45] The Worms Maḥzor of 1272 (MS Jerusalem Heb. 4⁰ 781/1).

which were written between 1281 and the beginning of the fourteenth century present the widespread use of the innovative pricking method. Among some sixty parchment manuscripts using the complex ruling (requiring guiding prickings for horizontal lines) which were produced in Germany and in France between 1281/2-1310 only nine were found to have regular prickings in the outer margins only.[46] And yet, the single-margin pricking was not totally displaced from Ashkenazic ruling practices, and what's more, it enjoyed a revival in the late Middle Ages. During the fourteenth century around a third of the dated manuscripts with complex rulings from France and Germany were pricked in the outer margins only (in some of them a few quires were also pricked in the inner margins) even though most of them were written on equalised parchment (but not precisely thus in France, as noted) and were ruled by plummet, and in the fifteenth century around one half of the manuscripts produced in Germany during the fifteenth century were pricked in this manner. Our assumption that double-margin pricking was an outcome of the transition to dynamic coloured plummet ruling seems to be undermined by these data, although the data from manuscripts dating from the late thirteenth century and early fourteenth century confirm it. At any rate, it should be emphasized that the outer pricking does not contradict the main features of the new ruling method. These manuscripts, like those with both outer and inner margin prickings were produced from (completely or almost completely) equalised parchment and were ruled by plummet, but not every page was ruled separately, but rather each bifolium was ruled on both sides.

The data on double-margin pricking in Latin manuscripts are scarce, and it seems not to have been widespread on the European continent.[47] Nonetheless a similar shift has been noticed in the method of pricking in post-Norman Conquest England (1066) from outer margin pricking to double margin pricking,[48] although there is evidence of double pricking already in the early Insular manuscripts prior to the end of the ninth century.

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[46] They display a tendency of the French scribes to continue the older mode of pricking.

[47] Gumbert, *Words for Codices*, who proposed many terms for the various types of prickings, did not bother to propose a unique designation for this type. Indeed, only a few Latin manuscripts with double margin pricking have been found among the three hundred dated Latin manuscripts that I examined (see above, chapter 3, n. 146), five from the second half of the 12th century and two from the first half of the 13th century, all greatly oversize and all produced in France. An exception is MS Cambridge, CCC 192 written at the Landévennec Abbey in Bretagne in 952; this manuscript is not oversize, but it displays a number of codicological traits that may attest to its being written under influence of the Insular tradition (equalised parchment, quinion quires and ruling by hard point [see below, n. 120].)

[48] Ker, *English Manuscripts*, p. 43; J. Brown, 'The Oldest Irish Manuscripts and their Late Antique Background', in: Brown, *A Palaeographer's View*, p. 227.

Jones regards this type of pricking as an exclusive custom of Insular copyists, and attributed its occurrences in early Continental manuscripts to Anglo-Saxon or Irish influence.[49]

Pair pricking for guiding through horizontal lines

A custom pertaining to pricking which characterises France and the German lands only is the use of double pricks in the vertical pricking rows to mark through-lines. The custom is known to us from the earliest dated Ashkenazic manuscript from 1177, and it took root among Ashkenazic copyists until the end of the Middle Ages. While making the vertical column of prickings to guide the horizontal lines, regardless of whether only the outer margins or both margins were pricked, or whether they were ruled by hard point or plummet, many copyists would make two closely spaced prickings (instead of one) for special lines – one or two lines of the three upper, central and bottom lines.

These double prickings could appear in each of triads of lines, or only in one of them (as in the MS Firenze manuscript of the Talmud, the earliest witness for double

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[49] See Jones, 'Where are the prickings' (above, n. 31), p. 78, 80-82. See also his last article: 'Pricking as Clues to Date and Origin: the Eighth Century', *Medievalia et Humanistica*, 14 (1962), pp. 15-22, where he also discusses pricking of the intercolumnar writing surface. Jones reiterates his position that double margin pricking suggests Insular influence, but notes that the phenomenon is known in the eighth century in Continental manuscripts that were not written by English or Irish scribes, or under their influence. According to Brown, in Germany only the outer margins were pricked (p. 21), but in France both margins were usually pricked (p. 2). See E.A. Lowe, 'The "Script of Luxeuil": A Title Vindicated', *Revue Bénédictine*, 43 (1953), p. 340 [= *Palaeographical Papers 1907-1065*, vol. 2, Oxford 1972, p. 396]; J. Brown, 'The Distribution and Significance of Membrana Prepared in the Insular Manner', in *La paléographie hébraïque médiévale* (Colloques internationaux du Centre National de la Recherche Scientifique, 547), Paris 1974, p. 129. According to Vezin, *Annuaire*, p. 32, this ractice was revived by Latin scribes on the European continent in the middle of the 12th century, and yet he notes only a few manuscripts that were pricked in this manner. The oldest example Vezin found among the old collection in the Bibliothèque nationale in Paris is a single Italian manuscript written between 1145 and 1153; see J. Vezin, 'Les manuscrits datés de l'ancien fonds latin de la Bibliothèque nationale de Paris', *Scriptorium*, 19 (1965), p. 87. See also ibid., in *Annuaire de l'École Pratique des Hautes Études, IVe Section*, 109, Paris 1976-1977, p. 495. On the custom of double margin pricking in a small number of Gothic Castilian manuscripts until the mid-13th century, see E.E. Rodriguez Diaz, 'La factura del codice gótico castellano: un avance de resultados', *Gazette du livre médiéval*, 47 (2005), p. 5.

prickings among the dated manuscripts – in which double prickings were made in the penultimate horizontal line with prickings) or in combinations thereof. The lines that were pricked by double prickings – whether by hard point or plummet, were usually but not always ruled to the full width of the unfolded bifolium or page, from one pair of prickings to the parallel pair, unlike the ruling of the other lines that were bounded by the vertical margins. It seems that initially these double prickings were intended to mark where through-lines should be drawn across the width of the page or the opening[50] in such a manner as to emphasize the upper, central, and lower axes of the written area structure; over time, however, the custom of double pricking persisted although its function was perhaps no longer known. Apart from the manuscripts written in France and Germany, or written by immigrant scribes from these territories, we find double prickings for through-lines in a few manuscripts from Italy and Spain. The practice was of a widespread scope. It has been documented in the dated Ashkenazic manuscripts with complex rulings (50 percent in the thirteenth century, 61 percent in the fourteenth century, and 35 percent in the fifteenth century).

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[50] Indeed, Jacque Lemaire notes that the meaning of this pricking is unknown, but adds that sometimes it appears that its function is to remind the ruler to rule through-lines across the width of the page in these places. See J. Lemaire, *Introduction à la codicologie*, Louvain 1989 (Université catholique de Louvain: Publications de l'Institut d'Etudes Médiéval – Textes, Études, Congrès, 9), pp. 120-121. On this feature of English manuscripts after the Norman Conquest, see Ker, *English Manuscripts*), pp. 42-43. On this phenomenon is later Belgian manuscripts, see A. Derolez, *The Library of Raphael de Marcatellis, Abbot of St. Bavon's*, Ghent 1979, p. 11. Derolez notes that he has no explanation for the phenomenon. See also Agati, *Introduzione all codicologia*, pp. 186-187.

Single prickings unrelated to the horizontal lines

Finally, mention should be made of the marginal single prickings that have only recently been discovered, and the function of which is yet unclear, but which seem to derive from the use of a mechanical instrument for ruling lines in pale ink as well as from the use of a rake by which groups of lines are drawn in ink. These ruling techniques will be discussed in connection with the rulings whose horizontal lines were not guided by columns of prickings, but which evidently also required a minimum of prick to guide the positioning or operation of the instrument in order to achieve uniform and regular rulings. Thus Derolez found a single prick, usually in the outer margins and in a position that does not correspond to any of the ruled horizontal lines, in most of the Humanist parchment manuscripts that were written in Italy during the Renaissance and ruled in ink, apparently by means of mass production with an instrument whose nature is still unknown.[51] Following this discovery by Derolez, there have recently been observed in a selected Latin manuscripts and ink-ruled Hebrew Italian manuscripts, not only a single pricking (executed in one go on each of the folded quire's folios), but also miniscule single prickings in several places – two or three in the outer and inner margins – which do not correspond to the horizontal rulings.[52] Presumably similar single prickings exist in other Hebrew manuscripts but were not noticed at the time of documentation many years ago and have not been examined since.

At the time when Derolez noticed the single prickings in the Humanist manuscripts, Gumbert noticed an unusual pricking in one of the ink-ruled manuscripts from the fifteenth century (especially Dutch manuscripts) – a single pricking appearing in the outer margins, uniformly spaced to correspond to groups of lines.[53] Following one of his student's suggestions, Gumbert hypothesized that these prickings attest to the use of a rake-like instrument, which could draw several lines in ink at once, and which was guided in a manner yet to be clarified by a single anchoring prick.

A completely different type of pricking, not related in any way to ruling, has recently been observed in a few Hebrew manuscripts. Here several tiny slots are found in a

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[51] See Derolez, *Codicologie*, vol. 1, pp. 77-87.

[52] See Casagrande Mazzoli, 'Rigatura'; Pasternak & Beit-Arié, 'Enigmatic Ruling Device', pp. 10-16. See also the sketches of the location of the single prickings in the dissertation by M.C. Brunello, *Techniche e strumenti di rigatura nei manoscritti latini: I codici commissionati da Malatesta Novello*, Università degli Studi di Udine 1999-2000, p. 75.

[53] See Gumbert, 'Ruling by Rake'.

columnar arrangement at the edge of the inner margins, close to the fold of the bifolia. These slots are widely spaced and it is clear that although their disposition is symmetrical they do not correspond to the ruled lines with their uniform spacing but rather to the places where the quire was stitched in the opening for the purpose of binding the codex.[54] Similar prickings for guiding the binding of the quires, which are hidden by the original stitches and only revealed after they are unstitched, have recently been observed in Latin manuscripts in a collection of manuscripts – mostly endowed by a Humanist who passed away in 1469 – in Friuli in northern Italy.[55] It is possible that marking the placing of the stitches was common in northern and central Italy but went unnoticed.[56]

B. Ruling

The lack of Hebrew codices – at least of dated ones – produced before the tenth century may explain why there are so few Hebrew manuscripts that were ruled in the complex modes revealed in the Latin manuscripts produced in French scriptoria before the tenth century[57] or in the British Isles or in Greek manuscripts (even from later periods).[58] Due to the widespread diffusion of Jewish communities, we find Hebrew manuscripts – throughout the ages and in a variety of regions – which are ruled by diverse techniques but almost wholly in simple fashion, i.e. with uniform ruling units and a single implementation of either a single folio, or bifolium at a time, or in combinations limited

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[54] Nurit Pasternak first observed this phenomenon in Italian Hebrew manuscripts, mostly in those produced by Yitsḥaq ben 'Ovadia of Forlì, who was active between 1427 and 1467, especially in Florence. This kind of pricking appears already in the first manuscript written by Yitsḥaq ben 'Ovadia in Florence in 1441 (MS London Or. 19944-19945) and in at least another eight manuscripts written by him. See Pasternak, *Together and Apart*, chapter 6, section 5.

[55] Casagrande Mazzoli, 'Rigatura', p. 429.

[56] Prickings made to guide the stitching of quires had already been observed by Gilissen in several Latin manuscripts from than the 12th and 13th centuries. See L. Gilissen, *Prolégomènes à la codicologie*, Gand 1977, pp. 182-185; idem, *La reliure occidentale antérieure à 1400*, Turnout 1983, pp. 90-94, 136-145. Since Gilissen noted that one of the 12th century manuscripts was rebound in the 15th century, is it possible that the rest of the few manuscripts he mentions were similarly rebound in during this century in Italy, and it was in that instance that the quires were marked with prickings by the binder? Or could the opposite be true and the Renaissance binders in Italy revived a Carolingian custom that had disappeared, in the same manner that Humanist scribes sought to revive the Carolingian tradition of bookcraft?

[57] Such as those described by Rand, e.g. E.K. Rand, 'How Many Leaves at a Time?', *Palaeographia Latina*, 5 (1927), pp. 52-78.

[58] For a summary of thirteen systems of ruling (some of them exceedingly complex) in Greek manuscripts, based on a survey of 2500 manuscripts predating the 13th century, see J. Leroy, 'La description codicologique des manuscrits grecs de parchemin' (above, chapter 5, n. 52), pp. 27-41.

to two folios or two bifolia, and only in rare cases, in larger and more complicated groupings (several folios or bifolia, or a single quire in one go). Until the present no evidence has been found of ruling parchment sheets before folding into quire bifolia, as Gilissen and others have assumed was the practice in the case of Latin manuscripts.[59] The ruling instruments employed by Hebrew copyists were the hard point (the oldest ruling instrument), a metallic pencil (plummet), templates for blind ruling, which were apparently different in the Occident from those used earlier in the Orient, as well as some sort of instrument for ruling with pale ink (the latest type of ruling instrument).[60] Rulings varied not only in respect to technique, i.e. the instrument employed (roughly divided between blind relief rulings and coloured rulings) but also according to the manner of implementation. For the codicologists or users of the manuscript who wishes to identify its provenance and date, identification of the actual ruling technique – hard point or plummet, etc. – will not suffice; rather, they will have to uncover the exact method of relief or coloured rulings. By this we refer to the frequency of direct ruling applied to the folios of the quire or its bifolia. Was each folio or bifolium ruled separately, or were several folios and bifolia ruled together? And if several folios were ruled in one go, where was the initial ruling made, and where did its imprints appear? Were direct rulings systematically applied to the hair side or the flesh side or to the recto or verso pages?

1. Relief rulings

Relief ruling by hard point was the standard ruling method in early Hebrew parchment codices in the Orient, the zone from which we have extant dated manuscripts as early as the tenth century. It was in this zone also that a second, mechanical method of relief ruling was first developed, adapted to producing paper manuscripts. Relief ruling by hard point was used also in the Occident as a standard method in the early period, and in some regions this technique survived until the late Middle Ages. Relief ruling by hard point was also used as a standard ruling method in Latin parchment manuscripts until it was supplanted by coloured rulings from the end of the eleventh century onward, but was renewed by Humanist copyists in Italy in the early fifteenth century, especially

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[59] See above, chapter 4 (on quiring), n. 9.
[60] Maniaci, *Archeologia*, p. 87, distinguishes between three aspects of ruling: technique, method, and type (the layout of the rulings, discussed above).

in Florence and later in Naples, driven by their desire to emulate the appearance of the Carolingian manuscripts which were sources of inspiration to them.[61]

As mentioned, relief rulings were made by one of two methods. Rulings could be made by any kind of hard and rigid implement – perhaps a rather blunt knife or a stylus – hard point that left sharp furrows on the side of the page (or unfold bifolium) that was ruled directly, and ridges produced simultaneously on the other side of the same folio or bifolium; alternately, rulings were made mechanically by a ruling instrument that left sunken and rather broader furrows impressed on the side of the page that was ruled directly and relief ridges on the obverse side. In one stroke, therefore, the furrows (or ridges) were produced on the ruled or imprinted side, with relief lines on the other side of the folio in both relief techniques. In the hard point ruling the furrows could simultaneously produce an identical imprint on the next folio (or unfolded bifolium) when that was placed on the ruling board and pressed over it. Even without exploiting the imprinting technique to rule more than a single folio, the very use of either technique is economical. While ruling one side of a ruling unit (folio or unfolded bifolium), the obverse side was ruled simultaneously. Both relief rulings guaranteed an identical layout of the written area on two pages (or two sides of a bifolium) at least.[62] Ruling by board was even more economical, because it produces the entire indented ruling grid in one go.

1a. Relief ruling by hard point

Relief ruling by hard point,[63] which indents sharp vertical and horizontal lines and creates ridges on the reverse of the ruled side, was always guided by prickings and was

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[61] On the distribution of hard point ruling among Humanist manuscripts in Italy in the 15th century, see Derolez, *Codicologie*, vol. 1, pp. 72, 76, 79-81. In an article published later, Derolez described the connection between the technique of ruling in the Humanist manuscripts to the types of ruling. See A. Derolez, 'Ruling in Quattrocento Manuscripts: Types and Techniques', *Septuaginta Paulo Spunar oblata*, ed. J.K. Kroupa, Prague 2000, pp. 284-294.

[62] According to Maniaci (*Archeologia*, p. 90), hard point ruling made writing more difficult because of the ridges and furrows. This may have been true for Latin or Greek writing, but in the case of Hebrew writing, in which letters were always written below the ruled lines (and at most barely touched the line), and in France and Germany where they generally written in the interlinear space, one should not assume that hard point ruling interfered with the movement of the scribe's pen.

[63] For the terminology of hard point ruling in medieval Rabbinic literature, see below, section 2.a: plummet ruling. In Western European languages no terms exist for the engraving action, but the terms used rather indicate the putative instrument used to engrave the ruled lines – stylus, hard point, dry point, in English; and pointe sèche, stylet pointe in French (see Muzerelle, *Vocabulaire codicologique*).

mostly applied in parchment manuscripts. Because this method of ruling produced an indirect impression not only on the reverse side of the ruling unit, but also on adjacent folios or bifolia, the use of this technique diverged into several traditional patterns of implementation corresponding to the number of folios or units that were ruled in one go. Hard point ruling methods are also distinguished by the side of the parchment to which the hard point was first directly applied – the hair or flesh side, or the side of the folio, the recto or verso pages. The latter distinction is relevant especially to paper manuscripts. While the complex hard point ruling technique was applied almost exclusively to parchment manuscripts, in the Middle East early paper codices (dating from the eleventh century and the late twelfth century especially) were ruled by hard point, as were the earliest parchment codices of the tenth century, and, as mentioned above in the section devoted to pricking methods, they were characterized by the use of guiding prickings. In addition, a number of paper manuscripts from fifteenth century in Italy were ruled by hard point (or plummet), guided by columns of outer-margin prickings.

Sometimes the lines ruled by hard point collected dust over the years, creating the impression that these were not blind rulings, but rather coloured rulings made by a plummet, and care must be taken not to be misled by this false impression.

1a1. Ruling by hard point, each unfolded parchment bifolium, on the hair side
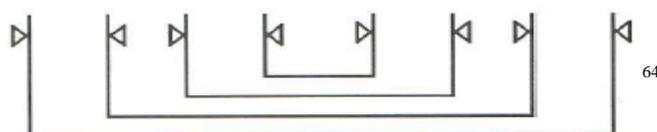
Such rulings had to be executed before assembling the quire's bifolia, arranging them according to Gregory's Rule, folding and temporarily stitching them (above, beginning of chapter 4). The ruling of the horizontal lines was always guided by outer-margin pricking only, which was usually executed on all the folios of each folded quire in one

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[64] In Greek and Latin codicology a number of notational conventions are used to represent the method of hard point ruling, especially with the use of triangles and angles oriented toward the direction of the ruling, e.g. <<<< | >>>> or ►►►► | ◄◄◄◄. Direct ruling is frequently represented by a hollow triangle, while secondary rulings formed by the impression of ruled line on the adjacent folios or bifolia are represented by an angle. Some of the following sketches follows Sautel & Leroy, *Répertoire* (above, n.7)

go — as far as we can judge by the shape and direction of the pricking slots, in manuscripts where the track patterns survived the trimming of the outer margins (inner margin prickings were always preserved in manuscripts with both inner and outer margin prickings). We must infer from analysing the pricking and ruling features that first the quire was assembled for the regular pricking of all of the quire's bifolia, then disassembled for the sake of the ruling, and finally reassembled and ruled on their hair sides. (To this end they may have been arranged in violation of Gregory's Rule, i.e. all the unfolded bifolia from the disassembled quire were arranged with the hair sides facing up, for more efficient ruling). After ruling, the bifolia were rearranged into quires according to Gregory's rule. Each opening displayed not only the same parchment skin side – flesh or hair – on facing pages, but also the same ruled sides, either furrows (on hair sides) or ridges (on flesh sides), alternately. It therefore transpires, that the pricking process, which was executed when the quire's bifolia were assembled according to Gregory's Rule, preceded the ruling process, which must be executed on disassembled quires. This leads to the inescapable conclusion that the pricking process contradicts the ruling process, which had to be done on the separate quire's bifolia, and disturbs the ergonometric convenience of arranging the book's pages for the purpose of copying.
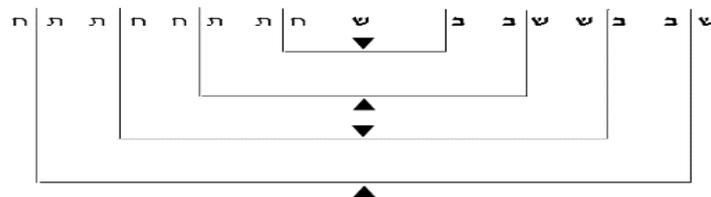
Ruling each unfolded bifolium separately on the hair side

ש hair side   ב flesh side
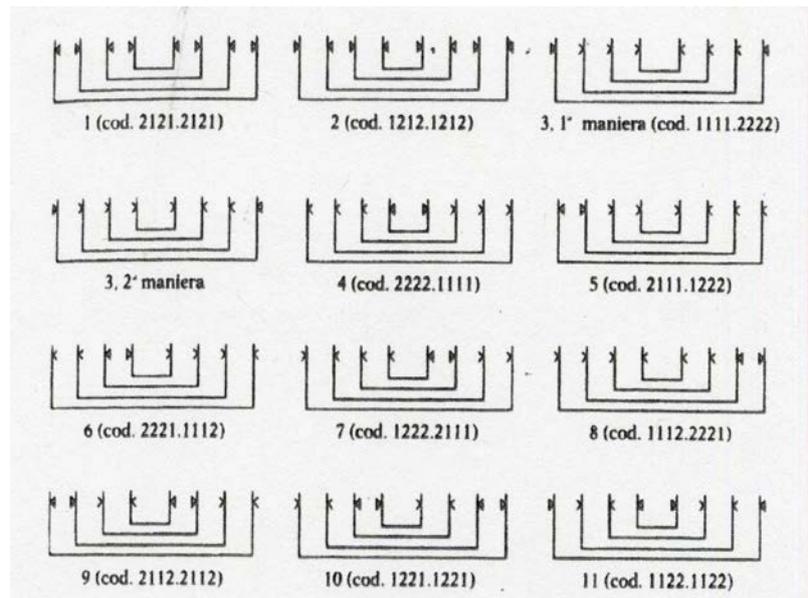
This mode of ruling which was ergonometrically inconvenient and un-economical, had an aesthetic advantage of an expected harmonious complement to Gregory's rule. It appears that the aesthetic consideration and the preference for a harmonious and symmetrical design of the book's openings prevailed over ergonometrically convenience and the desire to save production costs. This system was the standard ruling practice in the production of Hebrew parchment manuscripts in Italy since the earliest extant manuscripts of the eleventh century and until the final decades of the fifteenth century. Only in the fifteenth century, following the adoption by Italian Hebrew copyists of the special coloured ink ruling, which characterised a good proportion of the Humanist parchment manuscripts, was the technique of hard point ruling gradually supplanted by coloured ruling. It may be that some of these manuscripts were written on pre-composed and pre-ruled quires, which were prepared in bulk and sold to copyists. Coloured ruling, which began to appear in Hebrew manuscripts in the 1430s became the most widespread ruling technique during the final three decades of the fifteenth century, however the old technique of blind relief ruling continued to be used by a few copyists until the end of the century.

In the Ashkenazic zones, the technique of ruling each unfolded bifolium separately on the hair side was the only practice that was suited for use with parchment with easily distinguishable sides, until the last third of the thirteenth century. At around the same time, the use of equalised parchment began to spread in tandem with the spread of coloured ruling by plummet, which quickly began to replace the technique of hard point ruling, and already during the second half of the thirteenth century became the most

widespread ruling method (see below). During the transitional period between these two ruling methods and the two parchment types in the second half of the thirteenth century we also witness a mixing of methods – manuscripts ruled by hard point according to the old method but written on equalised parchment processed according to the new methods, whose bifolia were arranged by alternating matched furrows or ridges in the manuscript's openings.

Ruling the hair side of each bifolium separately by hard point was employed in many Sefardic manuscripts only from 1271 and later, and the less common method of ruling one folio at a time was practised there from 1198 onward. We shall see below that the standard ruling method by hard point before 1270 in the Sefardic regions was different – pairs of successive folios were ruled economically on the hair side in one go, guided by prickings in the outer and inner margins.

1a2. Relief ruling by hard point: each unfolded parchment bifolium on the flesh side

F   F
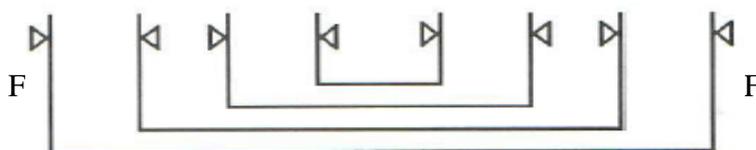
In the Orient, too, the practice of hard point ruling on each unfolded bifolium was employed, but always on the flesh side, unlike in Europe and the Maghreb. This is a unique practice that characterises the Oriental manuscripts, which, as noted, were written on parchment whose side difference is little, and even expatiates immediate identification of the sides.[65]

 Ruling on the flesh side characterizes almost all the early Latin manuscripts (most were presumably written in the Orient) that were produced before the end of the seventh century.[66] Manuscripts in Christian Palestinian Aramaic and Coptic and Ethiopian manuscripts were also ruled by hard point on the flesh side, on unfolded bifolia (personal communication by several scholars). According to Leroy, Greek manuscripts

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[65] Although here and there one finds Geniza fragments in which remains of hair roots are very visible, and which were ruled on the hair side, such as fragments of the Mishna of Tractate Bekhorot with Babylonian vocalisation, MS Oxford Heb. c. 17, fols. 35-43; MS. Heb. d. 42, fols. 7-15.

[66] As can be deduced from examining the volumes of Lowe's large corpus, *CLA*. However, most of the manuscripts that have survived from the 7th-8th centuries, until 800, were ruled on the hair side. Lowe himself noticed that most of the Latin manuscripts prior to 800 were ruled on the flesh sides (and their quires also began on the flesh side), see E.A. Lowe, 'More Facts about our Oldest Latin Manuscripts' (see above, chpter 5, n. 52), p. 61 [=idem, *Palaeographical Papers 1907-1965*, ed. L. Biehler, vol. 1, Oxford 1972, p. 274].

written in southern Italy, especially in the tenth century in the region of Capua, were also ruled on the flesh side, however by a different method – each unfolded quire was ruled at one go, with a primary direct ruling on the outer or inner bifolium.[67] The practice of ruling the flesh side has been observed in Beneventan manuscripts from the eleventh century, which were produced in the Abbey of Monte Cassino in southern Italy and in other monasteries which were closely associated with it. These codices were ruled by a style Latin codicologists call "the New Style" (and by equivalent terms in other European languages), i.e. hard point ruling of each bifolium separately, as opposed to the "Old Style" of the Carolingian manuscripts, whose quaternion quires were ruled in one go while unfolded.[68]

1.a.3. Ruling by hard point, each unfolded paper bifolium

Early Oriental manuscripts of the eleventh century, which were produced on paper, were, as previously noted, pricked on the outer margins and ruled by hard point applied to an unfolded bifolium (or several bifolia), apparently like parchment manuscripts. Yet the parchment bifolia were arranged within the quire after being ruled, with corresponding ruled sides, thus presenting either a hair side or a flesh side in their openings, while paper bifolia whose sides are barely distinguishable (only an expert can discern which side received the mesh imprint) were not arranged in the early manuscripts by corresponding ruled sides, i.e. with furrows facing furrows and ridges facing ridges. The eleventh century copyists gave preference to economy and ergonometrical convenience over aesthetic considerations and a homogeneous appearance of the book's openings. They arranged the paper bifolia in a regular order, from the outer (or inner) side, in such a way that all rectos of the first half of the quire and all versos of the second half display furrows.[69] Only at the end of the twelfth century did the Karaite scribe Avraham ben Amram HaCohen, who ruled his paper copies by hard point (like the practice of the eleventh-century scribes) according to a complex

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[67] See J. Leroy, 'Les manuscrits grecs d'ltalie', *Codicologica,* ed. A. Gruys & J.P. Gumbert, vol. 2: *Élements pour une codicologie comparé*, Leiden 1978, pp. 60-62; idem*,* 'Quelques systèmes de réglure des manuscrits grecs', *Studia Codicologica*, ed. K.Treu, Berlin 1977, pp. 296-298; idem, 'La description codicologique des manuscrits grecs de parchemin' (see above, chapter 5, n. 52), ruling methods no. 4, 5,

[68] See P. Busonero, G. De Francesco, P. Degni et al., 'Un sistema di rigatura nei codici cassinesi del secolo XI', *Aevum*, 70 (1996), pp. 213-216. On the "Old Style" ruling, see below in section 1.b.

[69] See *Codices hebraicis*, Part II, mss. 22, 25, 26, 33. In Oriental paper manuscripts the vertical margins were usually ruled by a different way than the horizontal lines.

and not always clear manner of pricking and ruling, arrange the ruled bifolia by matching furrowed sides, in resemblance to a parchment codex.[70]

1.a.4. Ruling by hard point successive parchment bifolia (or folios) in one go on the hair side

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An economical method of implementing hard point ruling is manifested in many manuscripts, especially those produced in the Sefardic areas. Successive folios (or rarely bifolia), arranged in the quire with corresponding sides, are ruled in one go; the usual number of folios or bifolia ruled together is two. The following next folios or bifolia showing the imprint of the direct ruling. The primary direct ruling was executed on the recto of the first of the pair of folios (or the first of the two bifolia) which always showed the hair side. The ruled furrows produced ridges not only on the obverse of the ruled side (the flesh side), but also impressed shallower furrows in the identical shape of the primary furrow on the third page of the pair of bifolia (or the third side of a pair

of unfolded bifolia) on the flesh side, while on the fourth page (or side), which was a hair side, the primary rulings were imprinted as shallow furrows that were frequently hard to detect.
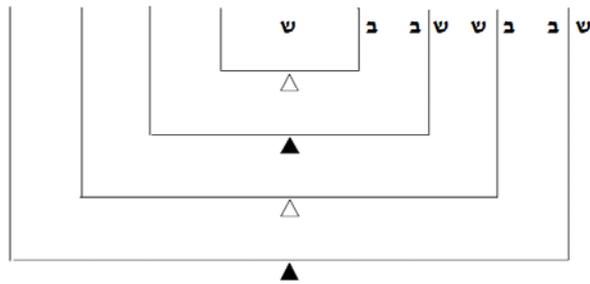
Ruling pairs of parchment bifolia in one go on the hair side

In manuscripts that were ruled folio by folio we find that the ruled sides and the indirectly ruled sides do not correspond in the openings, and the furrowed side or indirect furrowed faces the ridge side in the opening.

In a very few parchment manuscripts produced in Spain it is possible to infer that the economical method of ruling was applied to units larger than pairs of folios (or bifolia), even up to an entire quire, as is the case with Latin manuscripts until the Carolingian period, and a few early paper manuscripts produced in the Middle East. However, these Sefardic manuscripts were produced at a much later date.

The economical method of executing a primary ruling on four or two bifolia arranged as a quire according to Gregory's rule was first observed in the scriptoria of Tours in

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[70] See the dated manuscripts from his hand that have survived, ibid., Part IV, mss. 96-98, 100. For matching sides, see mss. 97, 100.

Latin manuscripts from the middle of the eighth century France ntil 820 (or slightly later).[71] This method, which disturbed the correspondence of the ruling sides, and was dubbed by its discoverer as the "Old Style" (the name by which it is still currently known), came to end during the Carolingian period. The lack of Hebrew European manuscripts from periods that predate the end of the eleventh century prevents us from knowing whether Hebrew manuscripts (perhaps outside Spain) were also ruled in this manner. The style was replaced by the "New Style" in Latin manuscripts where single unfolded bifolia were ruled and then arranged with corresponding sides,[72] in the same manner as Hebrew manuscripts in Italy, France, and German lands in the early period were ruled (cf. my discussion above, in section 1.a.1.).

Of course, ruling horizontal lines on several folios in one go required guiding by columns of prickings in both outer and inner margins. The ruling of several folios may have been executed after composing the quire's bifolia, must have been executed by placing some hard board under the folios, but the ergonometrics of the ruling procedure are unknown. The discovery of remains of temporary stitches (tacketing) in quire bifolia, (discussed above in the beginning of chapter 4 in the text referenced by n.14, and in the footnote), might indicate that this method of ruling was assisted by temporary stitching of the quire. The ruling of successive unfolded bifolia was also guided by prickings, but only by outer margin prickings. However, ruling the bifolia in this manner undoubtedly required disassembling the quire after the pricking, and later reassembling it, because the shape of the pricking slots in extant quires usually prove that the quire's folios were pricked in one go in their proper order (as described above in section A: Pricking, and cf. my discussion in section 1.a.1, above). In any event, this hypothetical procedure was ergonometrically complicated. In the Sefardic manuscripts that were always ruled in pairs of folios composed according to their order in the quire, from the recto page of the head of the quire and onward, one sometimes finds that the final pair of folios was methodically ruled in the opposite direction, on the verso of the final page inward.

The economical Sefardic system of ruling pairs of folios (and sometimes pairs of bifolia) which since the three final decades of the thirteenth century characterised the

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[71] See E. K. Rand, 'How many leaves at a time?' (see above, n. 57).

[72] See the summary and survey by Maniaci, *Archeologia*, pp. 91-92.

book production of parchment manuscripts in Spain, Provence and apparently also North Africa, is attested some three hundred years earlier thanks to manuscripts produced in the Middle East at the end of the tenth century and the beginning of the eleventh century by immigrants from North Africa, which survived together with early Oriental codices. The earliest clearly dated witness of the economical ruling method in manuscripts produced by Maghrebi scribes in the Orient is a biblical manuscript produced in Jerusalem in 988/989.[73] The immigrant scribe, Yosef ben Ya'aqov the Maghrebi,[74] used quires that had already been composed with corresponding sides and pricked, according to local custom, on the outer margin alone for the sake of ruling single unfolded bifolia. He added to them raws of inner margin prickings, and ruled each pair of folios in one go. Two other manuscripts written by a Maghrebi[75] scribe in the third decade of the eleventh century, the first certainly in Palestine, also reflects the economical method. Unlike the Oriental codices, in these manuscripts the outer and inner margins were both pricked initially, and a few of the quires' folios – two, and often four (half the quire) and even six – were ruled in relief in one go on the hair side.

The earliest manuscript produced in North Africa proper[76] (in the eighth century of the fifth millennium according to the Hebrew calendar, i.e. between 941 and 1039), which was written in Tunisia by four copyists, was pricked in the outer margins only. It was ruled in relief, but in a manner that was not uniformly applied, and this is undoubtedly a reflection of the indecisive nature of Hebrew bookcraft during the period of its consolidation in Tunisia and in its Spanish Muslim outpost, and its gradual disengagement from the influence of the Oriental tradition. A significant portion of the Tunisian codex (five of its thirteen quires) were ruled in a manner precisely identical to Oriental custom (ruling of each bifolium separately, unfolded, on the flesh side); one quire and a single bifolium were ruled in a manner that already embodies the departure from the Oriental tradition — the unfolded bifolia were ruled on the hair side (the ruling side that would eventually characterise all the European manuscripts). However, its largest portion (seven quires) was ruled in a different, more economical manner: two unfolded bifolia as ordered in the quire were ruled in one go. The direct ruling was

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[73] *Codices hebraicis*, Part I, Manuscrit 12.

[74] המערבי, i.e. Maghrebi, most probably from Tunisia.

[75] *Codices hebraicis*, Part II, mss. 19, 23.

[76] Ibid., ms. 29.

always executed on the hair side, and therefore the two outer bifolia in an unfolded quaternion quire (which always began with the hair side and was arranged with matching sides) were ruled on the outer side of the first bifolium, and the two inner bifolia were ruled on the inner sides of the central bifolium. The gains from applying this economical method of ruling were offset to a degree by the poor visibility of the ruling on the second bifolium of each pair that were ruled together, and especially in the fourth side, into which the ruled furrows were indirectly impressed. The copyists of these manuscripts indeed were required to re-rule the vertical margin lines on the fourth side of the pair of bifolia.

Indeed, the chief liability of the economical method (besides the mismatch of the sides ruled sides in the openings) was the faint visibility of the ruling on the final side of the stack of folios or bifolia, which obliged many copyists to re-rule these sides directly partially or entirely – at least its vertical boundary lines – with either blind or coloured rulings. By this action, the copyists counteracted the economical advantage of the saving ruling method, which nearly matched up losses and gains. There is no doubt that the need to re-rule, especially when done by a different technique, was a burden on the copyist, causing delays and encumbering the production process.

Rarely, the ergonometric method of ruling pairs folios was differently applied, not according to the order of folios in the quire, but to units of folded bifolia; i.e. the ruling was executed prior to the assembling of the quire (it is not easy to observe this method of ruling, since the pairs of bifolia's folios apart from those belonging to the central bifolium, were not, of course, adjacent to each other after the quire was assembled). Sometimes half of a quire (four folios) was ruled, and sometime even an entire unfolded quire (four bifolia) was ruled in one go. In a few of these manuscripts the ruling was executed on both sides of the four-folio or four-bifolia ruling units in order to overcome the faint visibility of the relief ruling. In a few manuscripts one can observed the application of combined methods of economical ruling.

Relief ruling of pairs of bifolia – a variation of the method of ruling pairs of folios which is characteristic of the Sefardic parchment manuscripts – is hardly manifested at all in the extant dated manuscripts before the end of the thirteenth century. As noted, the economical method of ruling a pair of adjacent bifolia in relief on the hair side was already manifested in the earliest manuscript produced in the zones of Sefardic book culture in North Africa. Apart from its partial implementation in the earliest extant

manuscript from Provence (written in Arles in 1202)[77], the ruling of pairs of bifolia is observed from 1284 onward in several manuscripts until the end of the century and in the fifteenth century. The use of this variation was measurably much less than that of ruling pairs of successive folios. Both manifestations of the economical method was common in Spain until the end of the Middle Ages, albeit at a rate that decreased over time: in the thirteenth century the method was used in 60 percent of Sefardic parchment manuscripts; in the fourteenth century this rate declined to one third of the manuscripts, especially during the first half of the century, while in the fifteenth century it dropped to a quarter. In any event, it was used in more than a third of all manuscripts in all periods prior to the Spanish Expulsion, and there is no doubt that this method and its sister method – relief ruling of adjacent bifolia – should be regarding as the characteristic ruling method of Sefardic book culture.[78] Moreover, before 1284 (according to the dated findings) all the Sefardic manuscripts - with the exception of the early Tunisian manuscript - were pricked in both outer and inner margins and its folios were ruled pair by pair, usually according to the order of the quire's pages,[79] on

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[77] MS Rome, The Jewish Museum in the Central Synagogue, see above, chapter 1, n. 90.

[78] Outside the Sefardic zones the technique has been found only in a few manuscripts that were not written by Spanish immigrants. Thus in MS London Or. 6712, written in Italy in 1277-1288, and in a manuscript written in Italy in 1399 and which was included in *Manuscrits médiévaux*, II, 4. An unusual relief ruling of multiple bifolia has survived, apparently, from early Ashkenaz, in MS London Harley 5508 (Margoliouth Catalogue 400). In an undated manuscript of the Babylonian Talmud, *Seder Mo´ed*, all of its quaternion quires were ruled in one go, unfolded, and the direct ruling was made on the hair side of the outer bifolium. The codicological traits of this manuscripts (such as the processing of the parchment, the pricking on the outer margins only, and the very use of relief ruling) attest to its antiquity. David Golinkin drew my attention to this manuscript *in situ*.

[79] Since in almost all of the Sefardic manuscripts the quires begin with the hair side, the technique of ruling in pairs naturally followed the order of the quire and was performed on all of the rectos of the hair sides. It follows that in the few manuscripts whose quires began on the flesh side, the rulers were obliged to rule the quire's pages out of order. This can been seen for example, in MS Oxford Arch. MS. Seld. A47 (Neubauer Catalogue 1), which was written in Soria (Spain) in 1303/4 on senion quires. The quires were ruled as follows ► (fol. 2r) > (3), ►(4r) > (5) ►(6r) V > (7) ►(8r) > (9r) ►(10r) > (11), i.e. in the order of the quire's pages, apart from the outer bifolium's leaves (fol. 1, which begins with the flesh side, and fol. 12); these folios were ruled with the bifolium folded backwards, i.e. ► (12r hair side) > (1), but the bifolium was then folded back again in order to insert it into the quire. This method of ruling quires that began with the flesh side was observed by Leroy in Greek manuscripts that were manufactured in southern Italy. See J. Leroy, 'La description codicologique des manuscrits grecs de parchemin' (see above, chapter 5, n. 52), p. 33. In a number of manuscripts the ruling of pairs of folios was not limited only to the recto of the flesh side, but could also be performed on the verso, in opposite direction to the order of the leaves in the quires, e.g. ► (2v) > (1 ► (4v) > (3), etc.

the hair side.[80] The pricking of outer margins only and the systematic ruling by relief of pairs of unfolded bifolia likely indicate that the manuscript was not produced before the end of the thirteenth century, even though similarly ruled folios are partially found in two earlier manuscripts.

As mentioned earlier, the ostensibly economical method of exploiting the quality of hard point for ruling several units – folios or bifolia – in one go, producing direct and conspicuously ruled lines as well as the impressions that grow fainter in the successive units – this technique proves ineffective in the many manuscripts displaying insufficiently visible rulings in the successive folios or bifolia. Notably, copyists were forced to re-rule the lines and the vertical bounding lines especially on the fourth page (or side, which was also a hair side), either partially or entirely.[81]

The special economical technique that characterised Sefardic book culture was also employed in Latin manuscripts produced in Spain before the twelfth century, and presumably the source of the Jewish custom derived from that practice.[82] Similarly, the practice of ruling pairs of folios was used in Greek manuscripts produced in the south of Byzantine Italy,[83] particularly in Calabria and Sicily in the tenth century.[84]

1.a.5. Relief ruling folio by folio

This technique was not infrequently used in parchment manuscripts in Byzantium and in the Sefardic zones (including in manuscripts written by Spanish immigrants in Italy and Byzantium) from the middle of the fourteenth century onward. Many Sefardic manuscript parchments ruled in this manner were pricked in both outer and inner margin, thus allowing the rulers to use this double pricking to guide the ruling of each folio separately; alternately, the folios were not pricked at all, and the rulings were

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[80] The abovementioned MS Rome, which was produced in Provence in 1202, was ruled in an unusual manner using a varied economical technique; in particular, each folded bifolium but also a few pairs of bifolia and even half a quire were ruled in one go.

[81] This phenomenon is visible also in inner leaves of Greek manuscripts from southern Italy (especially in Calabria and Sicily), whose quires were ruled unfolded at one go on the flesh side. See J. Leroy, 'Les manuscrits grecs d'Italie' (above, n. 67), pp. 60-61.

[82] See Vezin, 'Réalization matérielle', pp. 32-33 ; Vezin, *Annuaire*, p. 493 (where he attributes the information to Rand). See also A. Keller, 'Le système espagnol de réglure dans les manuscrits visigothiques', in *Le statut du scripteur au Moyen Âge – Actes du XIIe Colloque Scientifique du Comité International de Paléographie Latine (Cluny, 17–20 juillet 1998)*, Paris 2000, pp. 107–114.

[83] See Irigoin, 'Centres de copie byzantins' (1958), p. 214.

[84] J. Leroy, 'La description codicologique des manuscrits grecs de parchemin' (see above, chapter 5, n. 52), pp. 62-63. And see also above, n. 81.

probably guided by some kind of ruling board. The direct ruling was done either on the hair sides, or the verso (sometimes on the recto) sides.

This technique was apparently the standard one in use for paper manuscripts in all zones outside of the Middle East. The ruling could be executed on either verso or recto side, but usually on the verso. However, as will be seen below, it is quite likely that many of these paper manuscripts – especially those from Spain – were not ruled by hard point at all, as is demonstrated both by the lack of guiding prickings in the margins and by the depressed appearance of the furrows, but were rather presumably ruled mechanically with the aid of a ruling board of an unknown type either by pressing or rubbing the folio on it (like the mode of execution in the Orient, see below) and perhaps by templates that guided the ruling (in manuscripts where the lines are clearly engraved). This matter still requires re-examination of these manuscripts and a revisiting of the issue.

1.a.6. Relief ruling of parchment folios on both sides
This unusual and laborious technique involved ruling each page separately; in other words, the main advantage of using a hard point was not exploited, and each folio was ruled twice. This rare method of ruling was observed in a few manuscripts produced in Toledo (Spain) during the second half of the thirteenth century and yet in another few manuscripts from Spain and Provence. It also appears that a few Ashkenazic manuscripts were ruled in this manner. Only a very small number of Sefardic manuscripts were ruled exclusively by this method. In the remainder of Sefardic manuscripts this technique accompanies the ergonometric ruling, and seems to have emerged as a complement to this method, and as a remedy for the faintness of the secondary rulings on folios successive to those that were ruled directly. The very fact that in Ashkenazic manuscript this rare phenomenon accompanies the basic metallic plummet rulings indicates that perhaps the ruled lines visible to us as relief ruling on both sides of the folio were not created by hard point, but rather by plummet. The metallic composition of medieval plummet and the tendency of the pigments in the ruled lines to fade, as well as its use on every page might explain the semblance of page by page relief ruling in a small number of Ashkenazic manuscripts that were ruled by plummet.[85]

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[85] Just as plummet ruling can come to resemble relief ruling because of the metallic properties of the plummet and the erosion of pigments over time, sometimes relief ruling, conversely, achieves the

1. b. Blind ruling by means of ruling boards, frames, or templates

The other type of blind relief rulings mentioned above – the colourless kind – include rulings that were not guided by prickings in the margins of the bifolia or folios, but were executed with the aid of ruling boards used to impress lines onto the manuscript, or with templates that guided the rulings. The nature of the ruling board used in the Middle East to impress relief ruling on the folios of paper is known to us from Jewish and other sources, as well as some finds of such boards. The use of ruling boards in Europe is not documented prior to sixteenth century sources, and we can only deduce their earlier existence on the basis of observation of typical characteristics of such rulings in manuscripts. Similarly, one can only deduce the use of ruling instruments that produced several lines in one stroke, such as a rake, or that were produced with the help of guiding templates. Whether their existence is certain or surmised from the characteristics of the rulings, whether they were mechanically executed, or whether they were merely guided by aiding tools and templates, these techniques share the following features: a lack of guiding prickings; the uniformity and regularity of lines achieved by these ruling methods is more conspicuous than that achieved by relief rulings guided by prickings; instead of the sharp and deep furrows produced by hard point, one generally observes shallower and broader depressions in rulings executed by the techniques discussed here. This final trait is characteristic of Oriental paper manuscripts, most of which were ruled by a ruling board (כַּנָּה, see below, in the next section) unlike Oriental parchment manuscripts, but not of European parchment or paper manuscripts, which apparently were ruled with ruling boards of a different kind. In addition, one can observe in many rulings of this kind that the imprinted horizontal lines do not intersect with the imprinted vertical lines, but appear next to them.

To the category of mechanical ruling unguided by prickings one can add the technique of coloured ruling which seems to have been executed by means of an instrument of an unknown nature, such as the ruling of groups of lines in ink (probably with a rake) in Latin manuscripts from the Netherlands, and rulings with pale ink (and plummet), which may have been mass produced, in fifteenth century Hebrew and Latin

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appearance over time of plummet ruling, because of the accumulation of dust in the furrows. These appearances may mislead the codicologist into thinking that they are remains of plummet ruling.

manuscripts in Italy. However, these techniques will be discussed together with the coloured rulings.

1.b.1. Ruling paper by a ruling board (כַּנָּה) in the Middle East (misṭara/masṭara) and another presumed relief board in Europe

In a large proportion of Oriental paper manuscripts that were not pricked in the margin and not ruled by hard point as were the early paper codices it is apparent that their pages were indeed ruled by relief, but the ruling is not indented but rather impressed, and although the impression is uniform, it is clear that it was executed on each folio separately and consistently on one of the two sides (usually the verso). Moreover, not only are the impressions of the ruled lines not narrow and sharp as in hard point rulings, they are rather broad and superficial, and are not straight and linear as they appear in Occidental manuscripts but are rather slightly bent and curved. The Oriental manuscripts include several ruling patterns and their structures manifest a high degree of uniformity and regularity, unlike the European parchment manuscripts that were guided by prickings, which allow flexibility in adapting the ruling to the needs of the textual layout. The ruled lines in manuscripts produced on paper in the Orient without guiding prickings never exceed the vertical boundary lines – as they often do in manuscripts guided by prickings in both Orient and Occident – and it seems that they do not even touch them. They will invariably contain only one column of ruled lines and a single vertical bounding line to their right and left. All these traits indicate that this kind of ruling was mechanically produced with the aid of a ruling board, or was guided by some sort of guiding frame.

In describing the craft of Hebrew scribes in Yemen, which he had witnessed in his youth, Rabbi Yosef Qafiḥ attests to the method of ruling on paper practiced in recent generations:

> 'They did not rule with a ruler, but took a board forty centimetres in length and thirty centimetres by width, made precisely equidistant holes and threaded them with a strong string, tightening the string against the board, and when they wanted to make the ruling, they lay the paper on the board and rubbed their thumbs from above, and this ruled the lines in the pattern of the strings on the board. This ruling method is quick and precise and allows tens of folios to be

ruled in a few minutes. This board was called a maḥtara' <printing error, should have been mastara (personal communication by the late Rabbi Qafiḥ)>.[86]

Indeed, a wooden board of this type was collected by the German geographers H. Wiessmann and Rathiens during their travels in Yemen in the late nineteenth century, and it is kept in the Israel Museum in Jerusalem (see image). A similar ruling board could be viewed during the early 1990s in the hands of a Syriac scribe in the precinct of the Church of the Holy Sepulchre in Jerusalem.
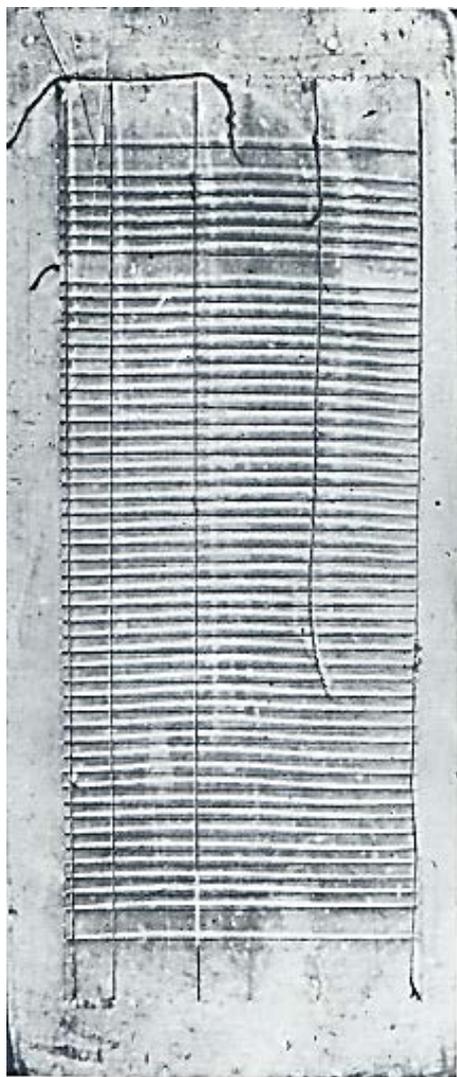
Similar ruling boards, made of cardboard, were used in an identical manner by Samaritan scribes in Nablus in 1960s Nablus at least until the 1960s, and boards of this kind were even used by the copyists in monastic scriptoria that survived in Western Siberia.[87]

Arabic sources on medieval bookcraft mention the term *mistara* as a ruling instrument.[88] The

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[86] See Y. Qafih, 'Kotevei u-maʿatiqei sefarim be-Teman', *Maḥanaim*, 106 (1965/6), p 156 (in Hebrew). The instrument's name is derived from the Arabic – misṭara (or masṭara), which means a ruler and ruling board. See also Gacek, *Vademecum*, entry misṭarah in the index.

[87] N.N. Pokrovskiĭ, 'Western Siberian Scriptoria and Binderies: Ancient Traditions among the Old Believers' (translated from Russian by J.S.G. Simmons), *The Book Collector*, 20 (Spring 1971), pp. 20-21. The article contains a photograph of two such boards.

[88] As in an early anonymous treatise on calligraphy cited in D.S. Rice, *The Unique Ibn al-Bawwāb Manuscript in the Chester Beatty Library*, Dublin 1955, p. 7; see J. Sadan, 'Nouveaux documents sur scribes et copistes', *Revue des Etudes Islamique*, 45 (1977), p. 33, n. 66. A French Orientalist documented the existence of a similar instrument made of cardboard, in the early 19th century. See A. Harbin, 'Essai de calligraphie orientale', in *Développements des principes de la langue arabe moderne*, 1803, p. 229 ; Cited in C. Hurat, *Les calligraphes et les miniaturistes del'Orient musulman*, Paris 1908, p. 13 (Yosef Sadan brought this to my attention). The latter described the preparation of the *mastara* and its use: a piece of cardboard the size of the page on which one wishes to write is cut out and is marked with the number of lines desired with the required line spacings; each line is covered by a silk thread which is attached to the two edges of the line; once this relief is ready, the cardboard is placed under the paper folio, which is pressed lightly with the finger or simply pressed with the sleeve of one's garment. For a
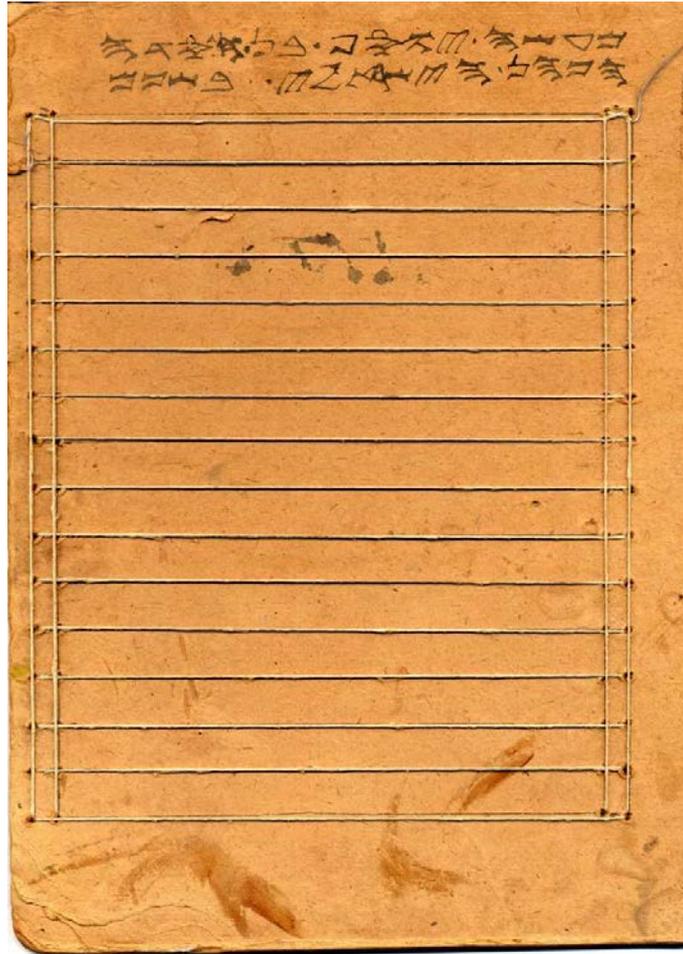
A cardboard ruling board used by a Samaritan scribe in Nablus in the mid-1960s. Given to me and kept at the Hebrew Palaeography Project, The National Library, Jerusalem

term is also mentioned in Judaeo-Arabic book-lists found in the Fusṭāṭ Geniza.[89] As a matter of fact, the term was already mentioned by Maimonides in his Arabic commentary on the Mishna. Kelim 12:8, as a translation for the name of tool called in Mishnaic Hebrew כַּנָּה, a term that according to this late identification ought to be used as the Hebrew word for an Oriental ruling board.[90]

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testimony on the use of the *mistara* for ruling Arabic manuscripts in Yemen during the second half of the 20th century, see 'Abd al-Rahman al-Ahdal, 'La réglure à Zabid: fabrication d'une tablette à régler (*mistara*)', *Chroniques du manuscrit au Yémen*, 5 (2008) [adapted from the Arabic, online publica].

[89] See Allony, *Jewish Library*, according to the index (especially in the list of Yosef Rosh Ha-Seder).

[90] See in detail, M. Beit-Arié, "Introduction', in *Sefer Pitron Tora, A collection of Midrashim and Interpretations: facsimile edition of a manuscript of the Jewish National and University Library Heb. 4º 5767*, Jerusalem 1995, pp. xix-xxiii (in Hebrew), and in my introduction to Codices hebraicis, Part III. As for the term כנה, which appears in the Mishna next to the termin a list of vessels that absorb impurity, see Maimonides' commentary on the Mishna *(Commentarie de Maimonide sur la Mischnah Seder Tohorot:*

publié pour la première en en araet accompagné d'une traduction hébraique par J. Derenbourg, Berlin 1887, p. 119): והכן הוא הקנה אשר, translated there: והכן הו אלמסטר אלדׁי תכט בה אלסטור, וכנה אלמסטרה. In the anonymus medieval Hebrew translation: . והכן הוא המסטר אשר. מסרגלין בו השורות, וכנה הוא הלוח (according to MS Paris Hébreu 329, fol. 131r . In יקו <=ישרטטו בו קווים!> בו השורות, והכנה היא המסטרא his Mishne Tora, in the halakha corresponding to the aforementioned Mishna, Sefer Tora, Hilkhot Kelim, 9:16, Maimonides wrote והכנה, והכן, והקולמוס של מתכת, והקולמוס ראש הקולמוס של קנה, והאולר שכורתין בו הסופרים <כך גרסת כתבי-היד (כמו הכתיב של כתבי-היד של מסכת כלים במשנה), ואילו גרסת הדפוסים היא ׳והכנא׳; ראו ש׳ פרנקל, ירושלים ובני ברק תשנ״ד> שמשרטטין בו הסופרים, כל אלו מקבלין טומאה. מהדורת According to the language of the commentary, Maimonides distinguishes between כן, which he apparently understood to be a ruler used to rule the lines with some kind of ruling instrument, and כנה, which is the mistara, presumably a ruling board. But this matter is not entirely clear, and it might very well be that Maimonides in fact identified the כן as a ruling board, and כנה as a ruler. Indeed, the word mastara was used in medieval Arabic to denote a ruler (see Dozy's dictionary, and the chapter on bookbinding by Muiz ibn Badis from 11th century North Africa, a fragment of which has been translated into English by G.K. Busch, ׳The Staff of the Scribes and Implements of the Discerning: An Excerpt׳, Ars Orientalia, 4 [1961], p. 4; more on the chapter and its publicatio see above, chapter 3, n. 86). The ruling board was apparently also called a מסטר (see Sadan, ibid.). Indeed in his instructions for writing a Tora scroll in Mishne Tora, Sefer Ahava, Hilhot Tefillin u-Mezuza ve-Sefer Tora, 9: 4, Maimonides clearly used the word כנה in the sense of a ruler used for measuring: <...> ואחר כך עושה כנה שווה יהיה ארכה ארבעים או חמשים אצבעות ויחלק אצבע אחד מהן (according to ואחר שכותב הדף <...> ימוד רוחב הדף באצבעות הכנה and later: <...> וימדוד כל עור ועור בכנה זו <...> the version of MS Oxford MS. Hunt. 80, which was written during Maimonides's lifetime and proofread against his personal copy as testimony to his authorization and signature at the end of the manuscript. See the edition by M.H. Haimsohn, vol. 2, Jerusalem 1975, fol. 167r, line 25 and fol. 137v, lines 3 and lines 9-11). In the standard printed editions the word קנה appears, but in the first edition <Rome, ca. 1480> כנה appears, as in the manuscript endorsed by Maimonides (see the facsimile edition by Mosad HaRav Kook, Jerusalem1965, p. 73), and so also in the Constantinople edition from 1508/9 (photographic edition, Jerusalem 1973, p. 31). Indeed, in his dictionary Eliezer Ben Yehuda, s.v. כנה, adopted the hypothesis of B.Z. Bacher that the correct reading in this halakha in Mishne Tora should be כנה and not קנה, to judge by the feminine pronouns in the passage and the citation used by Tanhum Yerushalmi., W. Bacher, Aus dem Wörterbuche Tanchum Jeruschalmi's – Nebst einem anhange über den sprachlichen charakter des Mainuni׳schen Mischne-Tora [Jahresbericht der Landes-Rabbinerschule in Budapest für das Schuljahr 1902–1903], Budapest–Strasbourg 1903, p. 142. In his lexicon to Mishne Tora, Al-muršid al-kafi, s.v. כן, הכן והכנה <...> פאקול אן כנה הי אלמסטרה אלדׁי תוצׁע באלערץׁ ויכׁט עליהא אלסטור Tanḥum Yrushalmi writes: מסתקימה. והכן אלתי תכׁט אלסטור. וקאל <הרמב״ם במשנה תורה, שם> יעשה כנה וימדוד העור בכנה והי מסטרה (Al-muršid al-kafi, ed. Hadassa Shay, Jerusalem 2005, טוילה שבה אלדׁראע יקיס בהא אלגׁלוד אלתי לספר תורה p. 258). Haddasa Shay translates into Hebrew: ובכן אני אומר שכנה היא הסרגל שמניחים לרוחב ומשרטטים את השורות ישר. והכן הוא שמשרטטים בו את השורות. ואומר כי כנה היא הסרגל ששמים אותו ברוחב ומשרטטים עליו שורות ישרות, והכן הוא שמשרטטין בו את השורות. ואמר <הרמב״ם> יעשה כנה וימדוד העור בכנה והוא סרגל ארוך כמו אמה שמודדים בו את העורות של ספר תורה Tanḥum therefore understands כנה to be a ruler used to rule lines, and כן as a ruling instrument. In his edition of Maimonides' commentary to the Mishna, Seder Tohorot, Hilkhot Kelim, Jerusalem, 1967/8, p. 127, Y. Qafiḥ understood Maimonides' intention similarly and translated הכן – הסרגל (n. 47): he commented on והכן – הוא הקנה אשר בו משרטטין את השורות, וכנה – הסרגל הכלי שבו לוחצין על הנייר או הקלף לסמון הקו, failing to notice that Maimonides had identified the instrument named כנה as a mastara, the very instrument Qafiḥ described in the abovementioned article on Yemeni scribal craft. In the Geonic commentary on Seder Tohorot attributed to Rav Hai Ga'on this pair of terms was interpreted similarly: והכן פ׳ירוש> בסיס <...> והכנה פ׳ כמין אמת הבנין <...> וכמ<ו> זה שמסרגלין בו את הספרים (Y.N. Epstein edition, ed. E.Z. Melamed, Jerusalem and Tel Aviv 1981/2, p. 27). It is possible that the term כן was interpreted generically as a 'base', unrelated to ruling instruments, according to its meaning in the Bible and the Mishna (See also M. Kelim 4:1: והוא כלי שמניחים תחת הכלים; but the term כנה is also used similarly in M. Kelim 7:1). At any rate it is clear that both the Geonim and Tanḥum Yerushalmi interpreted the word כנה as a ruler, according to Maimonides' usage in Hilkhot Sefer Tora. However, ׳Arukh explained the two terms in the Mishna in reverse fashion: הכן והכנה <...> פי׳ האמה שמסרגלין בה הספרים והלוח שמתחתיה ('Arukh Ha-Shalem, ed. H. Kohut, IV, Vienna 1884, p. 253, s.v. כן. Menaḥem HaMe'iri, in his book Qiryat Sefer, article 3, part 1 (p. 64 in Hirschler's edition) interpreted in a similar manner, based on Maimonides: הכן -- הדבר שמסרגלין בו, והכנה – הלוח שעליו מסרגלין, ופירושו שעושה לוח שבו מרבע היריעות ורושם רוחב האצבעות. According to Maimonides' language in the Mishne Tora, the Geonic interpretations, and Tanḥum Yerushalmi's dictionary, it would seem that the term כן should be

Furthermore, among the manuscript fragments originating in the Fusṭāṭ Geniza, two models of such a ruling board have survived. The two boards are made of used paper leaves that were gluing together. Cords forming horizontal lines and vertical boundary lines were threaded through holes that were pierced in the margins and glued to the surface of the board. At least one of the boards was used as a learning model, since the Judaeo-Arabic phrase מסטרה תגרבה קלם ושלום ('practice / exercise *mastara*') was inscribed on its reverse. The beginnings of the lines on this board were numbered with the characters of the Hebrew alphabet.[91] Indeed, in several Oriental paper manuscripts it is still possible to clearly

MS Cambridge T-S K 11.54

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preferred as a designation of a mechanical ruling board. However, a Hebrew source describing the ruling craft with the use of a כנה has been recently discovered, and henceforth there can be no doubt that this word in Mishnaic Hebrew was in fact used in the Middle Ages to designate a mastara and it is fitting that this usage be revived. The source in question is a treatise on the laws of the Sabbath, written, apparently by Yitsḥaq ben Shemu'el, and copied in the Orient in the 15th century. In this manuscript, which is privately owned, we read explicitly that the כנה is a blind-ruling board with attached strings on fol. 101v: השרטוט על שני פנים, יש שרטוט בלא צבע והוא כמין שעושין הסופרים לוקחין כנה שבה חוטין מדובקין ונותנים עליה הנייר או הקלף וידחוק האומן באצבעו עליו ונמצא משורטט (the ensuing passages are also invaluable as a knowledge source for ruling techniques and includes a description of hard point ruling with a ruler). I am grateful to Emanuel, who brought this important passage to my attention. The pair of words כן and כנה in Rabbinic Hebrew clearly had other that were unrelated to scribal tools, most probably various bases of utensils, as attested in the Tosefta version that parallels the Mishna: והכנה של זכוכית טהורין (Tosefta, end of tractate Kelim, Tosephta, ed. M.S. Zuckermandel, reprint of 18881 edition, Jerusalem 1963, p. 598).

[91] MS Cambridge TS K 11.54 (It was Ya'aqov Sussman who noticed this board and drew my attention to it; I previously published it in 1977 in my *Hebrew Codicology*). The used glued folios show Coptic writing. A photograph of this practice board appears in Reif's book, S. C. Reif, *A Jewish Archive from Old Cairo: The History of Cambridge University's Genizah Collection*, Richmond, Surrey, 2000, p. 211. A similar

discern remaining impressions of the thin twisted cord fibres that were pressed into the paper to form the lines.[92]
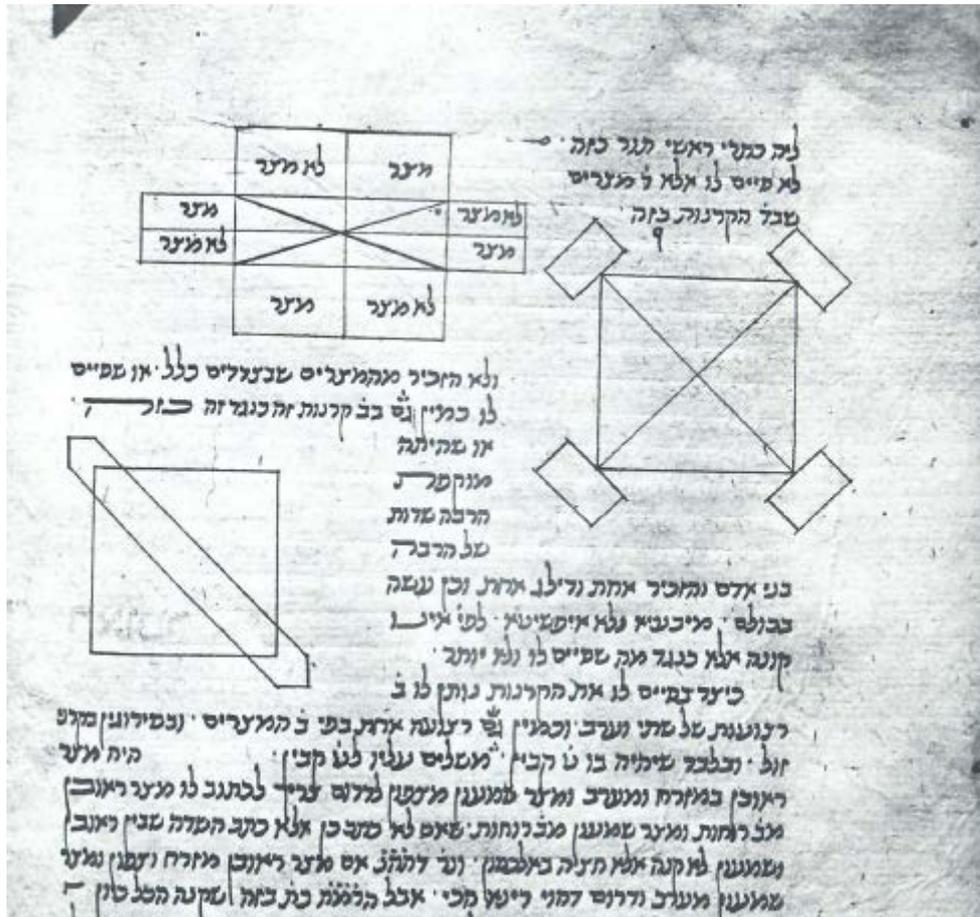
Impressions of the twisted cords pressed into the paper * Jerusalem, 1388 * MS New York R 1118, fol. 137v

The Oriental method of mechanical ruling with the use of a ruling instrument that produces line marking of an entire paper folio, surely represented a revolution in terms of the cost of production, for it obviated the need for copyists to use prickings as a scaffolding, and required a lesser investment in the ruling process. Indeed, this form of ruling has survived in dated Hebrew manuscripts, the first deriving from 1131, after a

board has survived among Geniza fragments in the Musseri collection in Paris (currently held on loan by the Cambridge University Library), IX, 167. (Paul Fenton referred me to this item). For a *mastara* board integrated into one of the binding boards of an undated Arabic manuscript in the Beinecke Library at Yale, New Haven (New Haven, Yale University, Beinecke Library, New Eastern Ms 11), see B. Layton, *Catalogue of Coptic Literary Manuscripts in the British library Acquired since the Year 1906*, London 1987, p. lxi. See also, Gacek, *Vademecum*, s.v. mistarah, pp. 231-232. The use of a *mastara* in Greek manuscripts has recently been described by M. L. Agati, 'Codicologia: 'Osservazioni e *riflessioni*', in *Storie di cultura scritta: Studi per Francesco Magistrale,* ed. P. Fioretti, Spoleto 2012, pp. 1-14.

[92] M. Glatzer, 'D'après des manuscrit hébreux, le stade final de la fabrication du papier et la réglure à l'aide d'un cadre', *La paléographie hébraïque médiévale* (Colloques internationaux du Centre National de la Recherche Scientifique, 547), Paris 1974, p. 53, pl. 37. A photograph of an empty page ruled by *mastara* in an Arabic manuscript, which illustrates well the appearance of this kind of ruling, appears also in Déroche, *Islamic Codicology*, p. 163.

time period in which the horizontal lines in paper manuscripts were not ruled at all for reasons of thrift, and the lines on either side of the folio did not overlap. By implementing the use of a ruling board, the Oriental copyists successfully surmounted the contradiction between reducing the cost of production and fulfilling the aesthetic need to rule the lines and guarantee the regularity and uniformity of the copying. This type of ruling is observed in at least 55 percent of paper manuscripts from 1131 until 1500.

Mistara. Leather, rope from natural fibers. 22,5 x 17 cm. Harar (East Ethiopia), 19th century. Brought by Nikolay Gumilev (expedition of 1913), MAE RAS, Col. No. 215411.
Kunstkamera Museum, St Petersburg. Photo by Efim Rezvan

It appears that that the use of relief ruling boards for quick, economical, and uniform ruling was also practised in Europe, but was not, however, mentioned in contemporary sources (as in the Orient), but only during the period just following the Middle Ages. As can be deduced from Hebrew dated codices, the use of ruling board in Europe began at least three hundred years after its advent in the Middle East. In Europe it was used especially for ruling paper manuscripts, but also for parchment manuscripts, although at a much smaller scale.

Absent empirical or written evidence for the use of ruling boards to produce European Hebrew manuscripts, the evidence for such use is largely drawn from logic, based on observation of certain characteristics of the ruling that reflect strikingly uniformity and regularity of the ruling in the manuscripts themselves. The conclusion that many of the parchment manuscripts ruled in relief were presumably produced with some sort of ruling board does not stem specifically from the appearance of the ruled lines, as in the Oriental paper manuscripts, but rather especially from the fact that while these

manuscripts were usually ruled folio by folio, they exhibit no columns of marginal prickings to guide the ruling of the lines; as noted, prickings are also lacking in the Oriental paper manuscripts with sunken relief rulings. The rows of prickings in the outer margins might of course have been trimmed in the process of rebinding over time, but this cannot be said of prickings in the inner margins that almost always stayed intact. The very act of ruling folio by folio requires guiding prickings in both margins and therefore their absence in the inner margins indicates that the lines were ruled without any guiding prickings at all, and could only have been produced with a mechanical ruling board or a template of some kind that guided the copyist in the ruling of lines[93] perhaps using the technique of hard point blind-ruling. However, the latter hypothesis does not conform to the appearance of the ruling which is usually not sharp and deep. The absence of pricking in manuscripts that were ruled folio by folio phenomenon is especially prominent in the Iberian Peninsula and in the outposts of Sefardic bookcraft, where it appears in 87% of the dated paper manuscripts produced in the fourteenth and fifteenth centuries. And yet, it is known that this type of manuscript was produced from the fourteenth century in other regions outside of Spain as well, especially in Italy, where the phenomenon is found in a small number of parchment manuscripts and in about half of the paper manuscripts and in Byzantium in about a third of parchment manuscripts and two-thirds of paper manuscripts.

The widespread use of unguided relief rulings in Sefardic manuscripts brings to mind the famous description by the Spanish calligrapher Juan de Yciar, in his book *Arte subtilissima*, printed in Saragossa in 1550, of a wooden ruling board strung with the strings of a musical instrument which were glued into engravings marking the lines. According to his account the board was overlaid with a folio or a bifolium and rubbed with cloth.[94] This description is strikingly similar to the descriptions and the findings of

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[93] Gumbert, 'Ruling by Rake', p. 48, cites a Spanish calligrapher from 1540 who spoke of a line guide in the form of a bifolium ruled with thick black lines, which was placed beneath the page being written on in order to guide the copying without the need for ruling.

[94] *A facsimile of the 1550 edition of Arte subtilissima <by> Juan de Ycíar* with a translation by E. Shuckburgh and an introduction by R. Stone, London 1958, London -- New York 1960, p. 37-38 (cited in Derolez's discussion of blind ruling without marginal prickings, which he noticed in parchment Humanist manuscripts [Derolez, *Codicologie*, vol. 1, pp. 72-73]). It should be added that the Spanish calligrapher noted that the source of the description is in the book by Alejo Vanegas del Busto, *Tractato de orthografia*, Toledo 1531. See also the translation of the Spanish source by Gumbert, 'Ruling by Rake', p. 54-55. It appears that in these manuscripts relief rulings were made not by hard point, but with the use of ruling boards. Derolez notes the inventory of a stationery store (cartolaio) in Ferugia from 1465, in which 'due tabule ad rigandum' (i.e. two ruling boards) are mentioned. For the reference to

the Oriental *mastara*. The Spanish calligrapher attests to the widespread distribution of mechanical ruling and the variety of its uses in the latter Middle Ages. The differences between the broad and coarse appearance of the relief rulings in Oriental paper manuscripts, which were produced by cords made of plant fibres, and the regular appearance of this type of ruled lines in the European manuscripts, which however are sometimes barely visible, is reminiscent of the visual differences between the Oriental paper and the European paper and their respective technological causes. As will be recalled, in the Orient the screen of laid and chain lines of the paper production mould was made of plant based materials that were looser and produced irregular and uneven marks on the paper sheets, whereas in Europe that plant based screen was replaced by a wire mesh that produced straight and regular laid and chain lines. If we draw a parallel between the paper craft and the art of ruling, it seems reasonable to assume that already in the fourteenth century the European ruling boards used cords from an animal source, as the later Spanish source mentioned.

The mystery remains of how the ruling boards – either the Oriental *mastara* or the presumed European ruling boards – were used to rule each of bifolium's folios in a uniform and regular manner, with no evident traces of a means for stabilizing the folio and anchoring it to over (or under) the board; a solution is yet to be found, and perhaps repeated and more precise examinations by researchers more cognizant of this problem might provide an answer.

1.b.2. Ruling by folding

Among rulings that were unguided by pricking one can also include this unusual and rare partial ruling, although it was not aided by either a ruling board or a template. The ruling method in question is eminently simple, not requiring any kind of instruments. It is observed in a few paper manuscripts and in one parchment manuscript, in all of which the ruling served only to demarcate vertical bounding lines. For example, in a manuscript written in Bologna in 1403, each folio was folded twice, and this marked the marginal lines (the fold outlined in this manner in the centre of the folio was not used). This improvised form of marking could only demarcate vertical lines, but not

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the publication of the inventory, see ibid., p. 72, n. 19). According to Derolez., the characteristic traits that help identify the use of a ruling boards are: absence of prickings, a rounded, rather blurred form of the lines where imprints of rope are discernible, vertical lines and horizontal through lines that do not extend to the edges of the page, and slight gaps at the crossing of the vertical and horizontal lines. Gumbert, ibid., enumerates similar traits in the coloured rake rulings he discovered.

horizontal lines. Indeed, this manuscript was written in prison, where no ruling means were available to the prisoner, although several manuscripts ruled in this manner, which were copied under normal circumstances have also been found.[95] In a few manuscripts, it is possible to observe the folding of several folios together.

2. Coloured rulings

Initially, so it seems, the coloured rulings were clearly and conspicuously visible to the ruler and to the reader and were an inseparable part of the written page's texture by emphasizing its architectural structure. However, to judge by the appearances of most manuscripts in the present – at least five hundred years after their production – the colouring of these rulings is frequently faint or has vanished entirely without leaving any traces in significant portion of the manuscripts, or having only left a few traces here and there.[96] Coloured rulings were made with the use of a metallic plummet, apparently

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[95] The manuscript prepared in prison is MS Paris Hébreu 814 (see *Manuscrits médiévaux*, I, 79). The manuscript was a copy of *Sefer ha'Ora* by Yosef Jikatila, in a fairly cursive script, and indeed the lines on either side of the folio do not overlap. There is no doubt that the prisoner-copyist held a copy that served him as a model, but he apologises for any possible copying errors and especially for having dared sometimes to emend the text without having access to his own books. The colophon of this manuscripts deserves to be cited in full:

^נכתב ונ^שלם על ידי בנימן צעיר ייל״ב בכמ״ר יואב ז״ל יום ג׳ חסד אל ^ביי״ב^ בחודש אב שקס״ג לאלף ה[ששי] ואתה ה׳ מגן בעדי כבודי ומרים ראשי יתברך אלוי אבי ועל דרך התנצלות לבעלית מודיע אני לרואה העתקתי זו אם רואה בו שיגגה שיסירנה ובפרט על שהעזתי להרים יד לכתוב קצת הגהות מתי מספר בהיותי במיצר בעיר בולוניא אז. ולבי היה סגור בחותם צר ^גם לא היה לי סמך מספריי אשר באהבתם שגיתי מנעורייי^ ואם שגיתי יעביר ה׳ עוני ויסיר חטאתי ואם חלום חלמתי ולא ידעתי ספר ופותר אין אתי והוא יכפר חטאתי ולא אמות והוא ינהגני על מות ויוציאני לרווייה מן המיצר קראתי יה עני במרחב יה ונאמר לפניו הללוייה אמן. ויזכני לראות בניי שבס^יי^בתם נכנסתי לפנים לפנייי.

An early example of marking a vertical line by folding parchment leaves can be seen in MS Karlsruhe, Badische Landesbibliothek, Cod. Reuchlin 3, a copy of the Prophets with Aramaic translation from 1105/6. This manuscript's copyist copied only the biblical text but did not prepare the rulings for the Masora Parva (or for a selection from the Masora Magna and addenda from the Yerushalmi Targum [Targum Pseudo-Jonathan]) and did not copy them. These were added by a different hand, and for the sake of writing the Masora Parva between the two columns of the text of the Prophets vertical lines were produced by folding (see *Codices hebraices*, Part III, Manuscrit 48). On the folding of bifolia in Latin manuscripts, See also D. Smith, 'Plaidoyer pour l'étude des plis: codex, mise en page, transport et rangement', *Gazette du livre médiéval*. 42 (2003), pp. 1-15 (Bernhard Bischoff already noticed the folding of quires in manuscripts from the 8th through 11th centuries, as presented ibid., p. 3). In the examples collected by Smith, not only vertical lines were marked by folding, but folding was used also to rule horizontal boundary lines marking blocs of text.

An Oriental example of ruling margins by folding is MS St. Petersburg Евр.-Араб. I 102, a paper manuscript from 1106 (*Codices hebraicis*, Part III Manuscrit 49). The horizontal lines in this manuscript were not ruled at all, and the written lines on either side of the folio do not overlap and are not equal in number. A late example is MS Parma Parm. 3464, Avraham ben David Ashkenazi's annotations to *Ma'arekhet ha'elohut* as edited by Yitsḥaq Eliyahu Finzi in his own hand during the years 1461/2-1464.

[96] However, an occult book of magic, comprising a large collection of remedies and alchemy, contains a recipe for erasable ruling ink, and explains how to erase the line rulings after the writing. See *Secreti del*

of varied compositions, or with ink. The halakhic rejection of metallic plummet, which will be discussed below, also certainly applied to the use of ink for ruling lines, although the halakhic authorities only explicitly mentioned plummet in their writings, because the reasons for rejecting plummet for ruling a Tora scroll were also applicable to inks which were used by Latin copyists close to the time the plummet was in use.

Adoption of instruments for coloured rulings (plummet or ink) marked a revolutionary turn in bookcraft in the cultures of the codex which adapted this method of ruling, although it is difficult to explain this shift from an ergonometric and economic viewpoint. The main transformation involves the transition from the economical blind hard point ruling, which permitted both sides of a folio or bifolium or even several folios or bifolia to be ruled at one go, to a labour intensive type of ruling, which required each page or each side of a bifolium to be ruled separately without the possibility of ruling several writing units in one go. However, alongside this limitation, coloured ruling allowed flexibility of the writing outline and the layout to match the needs and character of the copied text, as opposed to the absolute uniformity imposed by the blind relief ruling on the layout of at least two sides of a folio. In Latin manuscripts the relief rulings were replaced by coloured ruling (at first by plummet and later by ink) from the twelfth century onward, and dominated this craft from that point onward, except for in Humanist manuscripts. [97]

2a. Plummet ruling

The use of plummet for ruling appears in Latin manuscripts already at the end of the eleventh century, and at any rate, it was the most common method in use by the twelfth century onward.[98] It appears that in Christian manuscripts written in the Middle East,

ruerendo donno Alessio Piemontese, Venetia 1555 (the book is attributed to Girolamo Ruscelli who published it under a pseudonym). The book was published in many editions and translated into many languages; in French it was published in France in 1557. Monique Zerdoun introduced the French translation to Michèle Dukan, who presents it in her book (Dukan, *Réglure*, vol. 1, pp. 15-16).

[97] See the summary by Maniaci (*Archeologia*, p. 89), and see below. It is evident that Latin codicology has not produced comprehensive research about the diffusion of coloured rulings.

[98] According to N.R. Ker, beginning circa 1170 standard rulings in English manuscripts were made by plummet, but use of the plummet began before 1100. See Ker, *English Manuscripts*, pp. 41-42. In the Beneventan manuscripts in southern Italy plummet was in use since the 12th century. See: E.A. Lowe, *The Beneventan Script: A History of South Italian Minuscule,* Oxford 1914, pp. 293–294. German documents were ruled by plummet already in the 11th century, but its use became widespread only in the 12th century, see: C.T.G. Schönemann, *Versuch eines vollständingen*

plummet rulings preceded this practice in Occidental Christian manuscripts.[99] Hebrew copyists began to adopt this new ruling instrument hesitantly some one hundred years later, as we shall see below, first in the Ashkenazic zone, where plummet ruling gradually replaced relief ruling, and later also in Italy and in Spain, where its implementation was merely partial, but not in the Middle East or Byzantium.

There is no relation between the medieval plummet and the modern pencil. Pencils in current use are made of graphite, while the plummet used for ruling in the Middle Ages

Systems der allgemeinen besonders älteren Diplomatik: Als Handbuch für Archivare und den Geschäftsgebrauch, vol. 1, Leipzig 1818, p. 515. On the earlier use of plummet in several codices see also Vezin, 'Réalization matérielle', pp. 33-34. The earliest use known to Vezin is in a 9th century Latin manuscript, but he notes that widespread use of plummet is only evidenced in the beginning of the 12th century. According to him (*Annuaire*, p. 494), the plummet was in competition with the stylus from the end of the 11th century onward. He adds (ibid.) that partial use of the plummet was made in the 9th to 11th centuries in the ruling of single pages or for outlining initials, decorations, and drawings. See also Vezin, 'Manuscrits datés' (above, n. 49), p. 87. Numerous references to the initial use of plummet in the 12th century (especially for re-ruling Greek manuscripts) are collected by Hoffman in his article, P. Hoffmann, 'Contribution à l'étude des manuscrits du "Thesaurus Veritatis Fidei" de Buonaccorsi de Bologne. O.P.: Description et histoire des *Parisini graeci* 1251 et 1252', in: *Micellanea di studi in onore di P. Marco Petta per il LXX compleanno*, vol. 3, special issue, *Bollettino della Badia Greca di Grottaferrata*, n.s. 46 (1992), pp. 77–78, note 48. See also Canart et al., 'Réglure en couleur'. The authors' findings reveal the use of plummet in Latin manuscripts from Europe in the 12th century and in one Greek manuscript before 902. In the process of examining the appearance of the parchment in a large selection of some 300 dated Latin manuscripts that were produced in France and in the German Lands their environs, which we conducted for the purpose of comparing the parchment in Hebrew manuscripts (see above, chapter 3 in the appendix to the section 'Ashkenazic parchment') it was found that the earliest manuscript to be ruled by plummet is MS London Royal 6 A.V., which was written in Belgium before 1049 (according to the Watson Catalogue of dated manuscripts in the British Library, see above, chapter 3, n. 49). The second earliest dated manuscript that was ruled in plummet in the abovementioned selection is MS Paris Lat. 2092, which was produced some one hundred years later, in 1136, in Pévèle in northern France on the border of Flanders (the manuscript was not included in the the corpus *Catalogue des manuscrits en écriture latine portant des indications de date, de lieu ou de copiste*, vol. 2, see above chapter 3, n. 49). This was roughly the same year in which plummet ruling was emloyed in MS Vienna Cod. 918 which was written in Indersdorf (Bavaria, Germany) between 1143-1166.

[99] This is the conclusion that arises from descriptions of Syriac manuscripts. See W.H.P. Hatch, *An Album of Dated Syriac Manuscripts*, Boston 1946. Since plummet rulings were never used in Hebrew or Arabic manuscripts in the Orient, I tended to doubt Hatch's descriptions and was of the opinion that the manuscripts that he described as ruled by plummet should be re-examined, especially because of our tendency to describe engraved furrows that had collected dust as plummet rulings. However, in the meantime it has been established that Syriac copyists did indeed use plummet centuries before it appeared in Latin manuscripts. Sebastian Brock – who in recent years has also studied the codicology of Syriac manuscripts – noticed in a catalogue of Syriac manuscript fragments, which were recently found in the Monastery of Saint Catherine in the Sinai desert, that many fragments were ruled by plummet: at first, beginning in the 6th century only the vertical boundary lines were ruled this way, but eventually (for the first time in a fragment from the 8th-9th century) – the entire ruling was made by plummet. See S.P. Brock, *Catalogue of Syriac Fragments (New Finds) in the Library of the Monastery of Saint Catherine, Mount Sinai*, Athens 1995.

was metallic (English – plummet, French – mine de plomb, Italian – mina de plome)[100] and it was composed chiefly of lead, as evidenced indeed by the modern Hebrew word עיפרון.[101] The colour left by its use on parchment folios could be black or grey or various

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[100] For the English term, see Gumbert, 'Codicological Units', and for the terms in other languages, see Muzerelle, *Vocabulaire codicologique* (in the multilingual version).

[101] Sufficient information has not been accumulated about the chemical composition of the metallic plummet, by means of scientific laboratory analysis of a large corpus of manuscripts. Chemical spectography analyses conducted at the Hebrew University could not have been accurate because they also reflected elements of the processing of the writing material. According to Stiennon, medieval plummet was composed of three fourths lead and one fourth bronze, see. J. Stiennon, *Paléographie du Moyen Age,* Paris 1973, p. 159. But Gullick, in his article 'From Scribe to Binder' ([above, chapter 4, n. 14], p. 225, n. 16) notes that the plummet was composed of lead perhaps with the addition of tin. This claim relies on Cennino Cennnini, *Il libro dell'Arte*: *The Craftman's handbook*, tranl. D.V. Thompson, New Haven–London–Oxford 1932–1933, ch. 11) and on Theophilus Presbyter (Theophilus Presbyter, *De diversis artibus*, ed.& transl. C.R. Dowell, London 1961, Book 2, ch. 17, p. 17). Gullick (ibid.) distinguishes between plummet and crayon, whose hues range from light brown to dark black. See below the conclusion suggested by Hebrew manuscripts regarding two types of plummet.

Recently, advances in the chemical examination of the ruling plummet and the various types of coloured ruling have ben made by means of X-ray analyses. The examination was carried out through the collaboration of Italian codicologists and an Italian team of scientists, who implemented a technique called PIXE (for this method, see: P. del Carmine et al., 'Particle-Induced X Ray-Emission with an External Beam: A Non-Destructive Technique for Material Analysis in the Study of Ancient Manuscripts', in: Maniaci & Munafò (eds.), *Book Materials and Techniques*, vol. 2, pp. 7-27. Twenty five manuscripts – twenty of which are European Latin manuscripts from the end of the 12th century and Humanist manuscripts from the 15th century, and five of which are Greek – have been examined utilising this method. For the chemical composition revealed from this analysis of coloured rulings from these manuscripts that were ruled by plummet or ink, see Canart et al., 'Réglure en couleur'. This tests showed that in most of the manuscripts ruled by plummet the ruled lines were composed mostly of lead (Pb), and they are not homogeneous but rather granular, and even their colours are not uniform. The pale ink rulings in 15th century Humanist manuscripts (see below section 2.c: ruling with ink) contain mostly iron (Fe), usually combined with potassium (S) and sulphur (K). A similar composition has been found in the text's ink, but the ratios of these components are greater (presumably the ink was diluted in order to lighten it for the ruled lines).

Subsequently, experimental tests were carried out to identify the chemical composition of the ink as well as of the plummet rulings in the oversize Hebrew Bible from 1334 which is kept in Berlin's Staatsbibliothek, one of whose volumes was damaged during World War II, and which has been recently restored thoroughly and methodically, in a manner unprecedented for Hebrew manuscripts. The tests were carried out by a team from the Berlin's Federal Institute of Materials Research and Testing (BAM), headed by Dr. Oliver Hahn, applying a different method from that of the Italians, although it too uses X-Ray florescence (XRF), and making use of instruments that were adapted for this purpose by the Technische Universität of Berlin, see O. Hahn, T. Wolff, H.-O. Feistel, I. Rabin & M. Beit-Arié, 'The Erfurt Hebrew Giant Bible and the Experimental XRF Analysis of Ink and Plummet Composition', *Gazette du livre médiéval*, 51 (2007), pp. 16–29. The analyses of the Erfurt Bible revealed that the plummet rulings do not usually contain bronze, which is an alloy of copper mixed with one tenth tin, but rather an alloy of lead (Pb) and tin (Sn) only (an element that was not detected in any manuscripts from any period by the Italian study). This analysis also revealed that the relative proportions of these two elements are unstable, but that the relative proportion of the tin – which clearly was added in order to soften the lead – is much greater than previously determined (from a ratio of 0.45 to 15.20 in the first analyses).

shades of brown. One frequently observes colour alternations within the same manuscripts and even on the same page.

Presumably, the long delay in adopting this innovative tool was primarily due to the halakhic context reflected in the responsa literature, and the halakhic decrees from the twelfth century onwards. The diffusion of the use of plummet as a ruling instrument in European civilization led to a quandary pondered by halakhic authorities, whether it could be used to rule Tora scrolls, which must be ruled according to Jewish law, and which, according to a longstanding tradition, had been executed by hard point. The French, German, and Provençal authorities utterly rejected this substitute because of the ephemerality of the coloured plummet markings (a claim that is at odds with modern codicology's conventional concepts and classificatory approach, in which hard point relief ruling – the traditional method for ruling a Tora scroll – is thought of, and labelled as blind ruling, while coloured ruling is considered visible).[102]

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[102] The halakhic sources that discuss the possibility of ruling a Tora scroll with a coloured instrument shed some light on its material nature and traits and also on hard point ruling and its related nomenclature. See the response by Yitsḥaq ben Shem'uel (1115 – before 1184) cited by Barukh ben Yitsḥaq of Worms in *Sefer ha-Teruma* (Warsaw 1896/7, par. 196: 'mishpat sirtut sefarim', fol. 65r): שנינו במסכת סופרים ובירושלמי פרק קמא דמגילה מסרגלין בקנה. שמעתי משמו של רבי׳ יצחק בר׳ שמואל לאו דוקא בקנה, הוא הדין **בסכין** אלא לאפוקי **עופרת ומטבע** שהשרטוט צובע ממתכו. (The association between Baruch ben Yitsḥaq and Worms is completely erroneous, as Simcha Emanuel has proven, S. Emanuel, 'Biographical Data on R. Barukh b. Isaac', *Tarbiz*, 69 (2000), pp. 423-440. The author of *Sefer ha-Teruma* lived in France his whole life, and the book is a report from the academy of R. Yitsḥaq of Dampierre, who died in 1189. Barukh was one of the three disciples he chose to record his discussions [See H. Soloveitchik, *Principles and Pressure: Jewish Trade in Gentile Wine in the Middle Ages²*, Tel Aviv 2016, p. 25, n. 4 (in Hebrew)]. See also the reference to Rabbi Simḥa (late twelfth century) quoted by his disciple Yitsḥaq ben Moshe of Vienna in *'Or Zaruʿa* which mentions the use of iron and lead: ובשירטוט עצמו נסתפק מורי הר״ר שמחה במה צריך לשרטט אם אנו מקפידים בשרטוט המתקיים וניכר לעולם שישרוט **בברזל**. או סגי **בשרטוט הנראה לסופר** בשעת כתיבה כדי שיהא הכתב שוה כגון **בעופרת אע״פ שנמחקת השריטה** לאחר זמן. או אם רוצה לשרטט בסיקרא בצבע אחר המתקיים כל ימי שהכתב מתקיים׳ בסיקרא או בצבע אחר המתקיים כל ימי שהכתב מתקיים (Zhytomyr 1861/2, par. 543: 'inyan sirtuf' fol. 76r. Siqra (סיקרא) mentioned here is a light red pigment that was used for writing, like ink. See also the description by Menaḥem ben Shelomo HaMe'iri in his book *Qiryat sefer*: סקרא הוא צבע אדום הנקרא מיני (article 1, part 3, Hirschler's edition [above, n. 90], p. 31). In regard to ruling Menaḥem ben Shelomo HaMe'iri wrote: צריך שתדע שתדמסכת סופרים אמרו הלכה למשה מסיני שמסרגלין בקנה. ויש מפרשים בה שבא למעט שלא לשרטט בסכין אף בשאינו חד כ״כ. שמכל מקום אעפ״י שאינו מחודד יש לחוש שמא יחתוך הספר בשרטוטו. ומי׳ם בתוס׳ כתבו <המהדיר ציין ׳אור זרוע הל׳ תפילין סי׳ תקמ׳; סמ״ג מ״ע the editor כ״ה; הג׳ מיימוניות הל׳ תפילין פ״א הי״ב; ס׳ התרומה סי׳ קצו בשם ר״י בעל התוספות, ועי׳ טור יו״ד רעד׳> דלאו דוקא קנה אלא הוא הדין **לסכין שאינו מחודד**. ולא בא אלא **למעט שרטוט במטבע או בעופרת שהקלף מצטבע בהם** (p. 30). In his treatise *Tiqqun Sefer Tora*, Yom Tov Lipmann-Mühlhausen discusses whether ruling should be executed on on the written side, or on the outside side: קצותיו תלתלים זהו סירגול <...> והנה בכל מקום לשון חכמים שתופסין שירטוט במקום סירגול **שירטוט חריץ** כמו ושרט לנפש <...> לכן אומר אני שעושין חריצין מבפנים במקום הכתב, ואילו הן השרטוטין, ויש אומרים שהחריץ יהא מבחוץ כדי שיהא בולטות מבפני׳ משום דלשון תלתלים <...> דכתב הריב״ש <ראו לעיל במובאה מספר התרומה> על הא דמסרגלין בקנה <...> והוא לאפוקי עופר וצבע ואי מסרגלין מבחוץ שייך עופר וצבע מבחוץ <...> ותדע שמשרטין לצד פנים דבא״ז <=שבואר זרוע, ראו המובאה שלעיל> הארוך כתב וז״ל נסתפק רבינו שמחה אי בעי שיתקיים השרטוט לשרוט בברזל או יכול **לשרוט בבדיל או בעופרת** <...> על כן אומר אני דאין ספק ובודאי צריך לחרט בצד פנימי (D.S. Loevinger and E. Kupfer's edition, *Sinai*, 60 [1966/7], p. 267; discussion on pp. 266-267). See also Rashi's commentary on B.

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It stands to reason that the rejection of the plummet as a ruling instrument for Tora scrolls had repercussions for the ruling of non-ritual codices, and that therefore for an extended time period, copyists were averse to the use the plummet for the production of manuscripts. This aversion was not only psychological, but may have derived from halakhic reasons as well, since the laws pertaining to the writing of a Tora scroll also impacted the writing of non-ritual texts and even the writing of private letters, due to the fact that biblical verses, or parts of verses, which according to halakha required ruling, occurred in and were incorporated into all sorts of texts.[103] The avoidance of ruling with the metallic plummet began to dissipate gradually, at first partially, in the production of the earliest extant dated codices from France and Germany in the final quarter of the twelfth century, and in a manner that progressively spread within these zones during the thirteenth century, in particular during its final quarter.

It may be that the gradual acceptance of the new ruling instrument, despite the aversion toward it, which, as noted, was rooted in the halakhic rejection of its use for ruling Tora scrolls, was promoted by literary transformations, educational needs, and functional motivations concerning the text's readability and usability. Perhaps the adaptation of plummet for the ruling of Hebrew manuscripts by Hebrew copyists, despite the indirect aversion to it, resulted from a diminishing of original halakhic creativity during the thirteenth century which coincided with an increase of the anthological genre – the annotated texts, and the legal halakhic corpora embedded with glosses (*hagahot*) – which peaked at the end of the century.[104] The structures and layouts of the commentated biblical texts and the widespread halakhic corpuses, such as the popular

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Rashi תני ר׳ חייא כתבו באבק <בכתבי-יד : אבר> בשחור ובשיחור כשר: Shabbat 104b, concerning the *baraita*: was of the view that even אבר should not be used for writing, and explains the blackening effect of rubbing lead on parchment : בעופרת ומשחיר כשהוא משפשף עופרת על קלף. See M. Catane, 'Le monde du livre au temps de Rachi', Proceedings of the World Conference of Jewish Studies, 7 (1977), vol. 4: *History of the Jews in Europe*, p. 15 (in Hebrew). It seems that Rashi was referring to actual lead and not to a plummet. The first two sources were brought to my attention by the late Ephraim Kupfer.

[103] See B. Gittin, 6b, and the discussion of this issue in the *Tosafot*. See also Maimonides' view in his *Mishne Tora* (Sefer Ahava, Hilkhot Tefillin uMezuza veSefer Tora 7:16) as well as other sources cited in the commentary *Kesef Mishne* and *Hagahot Maimoniot*. See also Danzig, 'Ruling', pp. 314-344 (on alternatives to ruling in texts that include embedded biblical verses), 347-348 (where there is also an extensive discussion of the sources cited in the previous note and especially the tracing of the afterlife of the statements in Sefer *'Or Zaruaʿ* in other halakhic works [p. 347 n. 173*]; also cited there are statements from *Sefer ha-Manhig* [*Hilkhot ha-Get*], Warsaw 1884/5, fol. 83b, p. 166], which mentions ruling with 'lead like the monks' [p. 347]).

[104] See S. Emanuel, *Fragments of the Tablets: Lost Books of the Tosaphists*, Jerusalem, 2006, pp. 8-10 (in Hebrew). Emanuel distinguishes anthologies that collected fragments from the writings of the Tosaphists and summaries created by combining glosses and marginal glosses (artificially, without a connection to the interior text) from books that were already in distribution.

abridged version of *Sefer Mitzvot Gadol* by Moses of Coucy (written, apparently, in 1247)[105] – *Sefer Mitzvot Qatan* by Yitsḥaq of Corbeil in 1276/7[106] – were prone to being changed from page to page and necessitated a flexible and dynamic form of ruling, especially in regard to the vertical lines that guided the number and width of columns depending upon the amount of annotation embedded in the textual fabric or the ratio of commentaries.[107] Dynamic ruling, even if the variable elements consisted only of the vertical lines demarcating the boundary of the columns or of the windows embedded in the core texts while the grid remained uniform, cannot be executed by means of relief hard point ruling, because this ruling method imprints its pattern pattern, at the very least, on the obverse side of the folio (or bifolium) and sometimes even on additional pages or folios. In contrast, the use of plummet alone limits its application to one side of the folio or unfolded bifolium, and is suitable for all the literary genres of annotated texts and halakhic corpora that became widespread from the thirteenth century onward. Could it be hardly a coincidence that the diffusion of the use of plummet by Latin copyists overlapped with the consolidation of the Latin Glossed Bible and its diffusion during the twelfth century?[108] Nevertheless, whether it is the production of Latin or Hebrew manuscripts that is in question, we have no way of knowing whether the use of plummet as a ruling instrument began to spread due to of the literary developments that involved the merging or grafting of multilayer texts and to answer the educational need for integrating several components together, or whether, conversely, the technical possibility of creating coloured rulings on each side of a folio or bifolium catalysed the

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[105] On the date of the composition of the book, see Emanuel, *Fragments of the Tablets* (above, n. 104), p. 198.

[106] So it appears from the colophon, which was written by the author and copied at the end of a copy of *Sefer Mitsvot Gadol* in MS Paris, Bibliothèque Mazarine 447: שעזרנו על <...> ברוך מלך ישראל וגואלו המלאכה הזאת להשלימה, ותשלם המלאכה ביום ראש חדש אדר שנת שבע לאלף ששי בשנה שהיו קהילות הקודש בצרפת ביגון ואנחה, קדוש יעקב <...> ירחם ויביאנו ויטעינו בהר נחלתו ויחבש את שבר עמו ומחץ מכתו ירפא (fol. 287r). This colophon contains echoes of events that befell the Jews of France following the confiscation of their books in 1240, as well as of the public dispute between the Christian and Jewish representatives in Paris, in which the author participated alongside R. Yeḥiel of Paris, and of the burning of the Talmud and other holy books in 1242 and 1244 (See S. Schwarzfuchs, *Yehudei Tsarfat bi-yemei ha-beinayim*, Tel Aviv 2001, pp. 211-218 (in Hebrew). I am indebted to Simcha Emanuel for elucidating the information in this unique colophon (Emanuel emphasized in particular that the years 1244 and 1245 are both mentioned in the body of the text of the *Sefer Mitsvot Gadol*, a fact that is congruent with the content of author's colophon) subsequent to my examination the manuscript itself. The manuscript was apparently produced close to the time of the text's composition, presumably in the third quarter of the thirteenth century.

[107] See in detail at the head of this chapter, under the subsection titled 'Ruling patterns and the dynamic and changing ruling'.

[108] See Beit-Arié, *East and West*, pp. 95-99 and M. Beit-Arié, 'Why Comparative Codicology?', *Gazette du livre médiéval*, 23 (1993), pp. 1–5.

development of glossed corpora and their dynamic layouts, which were eminently suited to the contemporary intellectual climate and new instructional needs.

The beginnings of the use of plummet and its diffusion

The earliest manifestations of the plummet rulings in dated Hebrew manuscripts were implemented partially and in a secondary manner. The first extant manuscript with such rulings was apparently produced in France in 1188/9. Although it was ruled entirely by hard point, on a few pages in which the relief rulings were assumedly not clearly visible, plummet rulings of vertical margins and sometimes of horizontal lines were added, both on the hair sides and on the flesh sides.[109] A similar implementation occurs later in an illuminated Ashkenazic Bible produced in 1236 in Germany.[110] This magnificent manuscript was pricked and ruled according to the old method of pricking the outer margins only and ruling each unfolded bifolium separately on the hair side, but in some cases a plummet was used to re-rule the reverse side of the furrows (and here and there perhaps substituted hard point ruling). This manuscript also displays additional vertical lines ruled in plummet for the copying of the books of Job, Proverbs, and Psalms, which, as is frequently encountered in biblical manuscripts, follow a layout distinguishing them from the text of the other biblical books, with each column of text containing alternating indented lines. A chronologically proximal witness of a different auxiliary use of plummet in an Ashkenazic manuscript that was ruled by hard point can be seen in a manuscript from 1239, in the portion written by the main scribe.[111] In this manuscript the plummet was employed only in auxiliary rulings for ornamentation, and it follows that they were probably added by the artist who decorated it. The use of plummet to improve the visibility of the ridges on the reverse of the hair side during the transition period in Ashkenaz from relief ruling to coloured ruling is still discernible in the cop copies made by the one of the many copyists of an Ashkenazic manuscript ruled in the old method and written in 1253/4; this scribe pricked the inner margin of one folio, and not only its outer margin, as in the remainder of the manuscripts' folios, and ruled it one page at a time with plummet only.[112] The regular use of plummet to improve the visibility of the impressions of engravings on the flesh side, which are not always

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[109] *Codices hebraicis*, Part IV Manuscrit 84.

[110] MS Milano B 30 inf. – B 32 inf (Bernheimer Catalogue 2–4).

[111] MS Cambridge, St. John's College A 3.

[112] MS London Harley 5648 (Margoliouth Catalogue 518).

visible, is conspicuous in a manuscript produced in Germany in the old method in 1257/8.[113]

Traces of the use of plummet to re-rule only the vertical margins are visible in a few pages of an Italian manuscript – completed in 1235 – that was ruled by hard point, each unfolded bifolium on the hair side.[114] In this case too, the marginal lines were added on the flesh side, i.e. on the reverse of the engraved side, presumably because the ridges of the engraved furrows were not sufficiently visible. A similar example is a Spanish manuscript written in Burgosin 1260, which was ruled by a method that was unique to Spanish bookcraft, using hard point to rule two folios in one go, according to their sequence in the quire. With this economical method, the engraved markings became progressively fainter especially on the fourth page of each pair of folios until they required re-ruling, especially of the marginal lines. Indeed, traces of re-ruling are found on the reverse side of the folios ruled by hard point in this manuscript as well.[115] Complex ruling by plummet never spread throughout Italy, except for among Ashkenazic immigrants in the fifteenth century, although as we shall see, it was adopted there differently; nor was it used in the Sefardic zones, where the auxiliary use of the plummet persevered for the purpose of re-ruling, especially of vertical margins, in parchment manuscripts that had been ruled according to the economical method.

In contrast, manuscripts from France and the German lands and their environs show a gradual diffusion of the complex rulings by plummet, which involved a conspicuous change in the pricking technique and frequency of ruling and at least a double time investment, and became the standard ruling method. The earliest dated Ashkenazic manuscript that was pricked in the outer and inner margins, and was ruled entirely by plummet, each folio on both sides, was completed in 1264, apparently in Germany.[116] However, this manuscript was most likely preceded by another German manuscript,[117]

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[113] MS Oxford MSS. Mich. 617, 627 (Neubauer Catalogue 1033, 1035).

[114] Manuscrits médiévaux, II, 8.

[115] Manuscrits médiévaux, I, 5.

[116] This biblical manuscript is also written on equalised parchment. For further details about it and its prickings, see above, the text referenced by n. 42 and in the note. It should be noted that MS Oxford, Corpus Christi College 133, a prayerbook found in England prior to the end of the twelfth century, was already ruled entirely by plummet, but one ought to assume that it was produced in England under the influence of the ruling practices used in Latin manuscripts since after the Norman Conquest (see above, n. 98). For further discussion of this unusual manuscript, see Beit-Arié, *Makings*, p. 136, n. 68, and p. 138.

[117] MS Moscow Guenzburg Collection 615. On the identity of the copyist of the three first quires in this manuscripts, see above, n. 43.

whose first three quires were pricked on both margins and ruled entirely by plummet. Although this manuscript lacks a colophon, and would seem not to be datable, there is no doubt that these three quires were copied by the main scribe of an illuminated corpus of Bible commentaries written in 1232/3,[118] and it is safe to assume that they were written around that same year.[119]

In the final third of the thirteenth century, the use of coloured plummet spread throughout the German lands and France very rapidly. More than three quarters of the extant dated Ashkenazic manuscripts from this period were ruled by plummet according to the new method, compared to a mere quarter of them which were ruled by relief according to the traditional method. From 1301 to 1500, 96 percent of the parchment manuscripts were ruled by coloured metallic plummet, 3 percent were ruled by engraving plummet (see below), whereas only close to 6 percent were ruled by the old method of blind relief ruling by hard point (see below, the introductory remarks to Tables 26-34, and esp. Table 31).

Apart from the auxiliary uses of plummet to reinforce the economical blind rulings (as mentioned above), which continued in Sefardic manuscripts and in manuscripts in other zones outside of Ashkenaz, coloured rulings by plummet were not employed outside of Ashkenazic manuscripts. And yet, a different implementation of the metallic plummet in the ruling of Hebrew manuscripts diffused to a limited extent – an implementation that combined the old method of economical blind relief ruling with the new practice of coloured ruling as a compromise of the two techniques, as described in the next section.

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[118] MS Munich Cod. Hebr. 5. Shelomo ben Shemuel of Würzburg, the main scribe of MS Munich, pricked his quires in both margins (see above, in the text referenced by n. 43 and in the note.)

[119] The codicological comparison with MS Munich may support a later date of production for MS Moscow than for MS Munich. The data concerning these two manuscripts suggest that their scribe, Shemuel ben Shelomo, was the first of German and French copyists to execute rows of guiding prickings in both margins and to rule by plummet (as mentioned above in n. 43), a mode of ruling that became standard in Ashkenazic bookcraft in the course of the thirteenth century.

Plummet ruling. <France>, 1340 * MS Oxford MS. Opp. 14, fol. 72v
Rashi's commentary is written on many pages in shapes of illustartions to the Pentateuch.

2b. Ruling by engraving plummet

In certain Ashkenazic and Sefardic parchment manuscripts, and in not a few Italian manuscripts, one notices the use of a sharp plummet that engraved coloured lines on directly ruled pages. In these manuscripts one sees clearly that the direct ruling of each unfolded bifolium or of each folio is coloured, as in the Ashkenazic manuscripts, yet the ruling on the other side of the bifolium or folio is not coloured at all, but displays the ridges of the coloured ruling. In other words, the metallic plummet technique was employed by the copyists as though it were a hard point with which they ruled one side directly as engraved coloured lines, and which produced on the reverse side blind reliefs of the coloured lines (it was rare to have used this type of plummet to rule both sides of

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a bifolium or folio).[120] This kind of hybrid use of plummet and blind ruling presumably emerged as a compromise between the old and new systems, particularly in Italy. The bookcraft practised by Italy's Jewish scribes was very conservative and until the fifteenth century was not at all influenced by the changes that took place in Latin bookcraft.[121] Adoption of the engraving plummet enabled the Italian copyists to adhere to the traditional relief technique and at the same time use the new instrument. That the use of the engraving plummet in Italy and abroad was considered a type of hard point is evidenced in a number of manuscripts that display a mix of both ruling techniques – sometimes the quires were ruled by relief and sometimes by engraving plummet. It seems that the chemical composition of the engraving plummet was different from that of the soft plummet commonly used in the Ashkenazic manuscripts, but this matter is still waiting to be resolved by laboratory research.

The above phenomenon appeared in the final quarter of the thirteenth century together with the diffusion of the standard use of plummet in France and in the German lands. The earliest manuscript ruled by engraving plummet (mixed with the economical method of ruling pairs of folios guided by double margin pricking, which is typical of Sefardic bookcraft) actually comes from the Iberian peninsula – it was written in Lisbon in 1278.[122] An Ashkenazic manuscript, likely written in Germany, has survived from the same general period – 1286; it was pricked in both outer and inner margins (according to the new method that was suited to the use of plummet) and ruled entirely by engraving plummet, one page at a time,[123] as though it were being ruled with a

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[120] J. Leroy demonstrated that a few dozen Greek manuscripts from Byzantine Calabria (southern Italy) that were ruled by plummet employed as if it were an engraving tool, or that were ruled by engraving which was subsequently reinforced by plummet (or ink). Bibliographical references to his comments appear in Canart et al., 'Réglure en couleur', p. 206. I found no mentions of such a phenomenon in Latin codicology. However, I noticed the phenomenon in MS Cambridge, Corpus Christi College 192, which was written in the Landévennec abbey in Bretagne in 952. It appears that this manuscript reflects codicological traits that were influenced by the Insular tradition (see above, n. 47).

[121] See M. Beit-Arié, 'Towards a Comparative Typology of Italian Hebrew and Latin Codices', in Libri, documenti, epigrafi medievali: Possibilità di studi comparativi – Atti del Convegno internazionale di studio dell'Associazione Italiana dei Paleografi e Diplomatisti, Bari (2–5 ottobre 2000), ed. F. Magistrale, C. Drago & P. Fioretti, Spoleto 2002, pp. 377–396. It should be remarked that that ruling by plummet on one side only of parchment bifolia has been observed in quite a few Humanist manuscripts from fifteenth century Italy. See Derolez, Codicologie, vol. 1, p. 76, n. 26. Derolez does not attribute this phenomenon to the engraving action of the plummet, but rather to the transparency of the parchment that allowed the ruling to be visible on the other side of the ruled folio.

[122] MS Oxford MS. Can. Or. 67 (Neubauer Catalogue 2391).

[123] MS Paris Hébreu 1–3 (a single volume that was divided into three by splitting its quires, see *Manuscrits médiévaux*, I, 12).

standard plummet, and without using the sharp point of the plummet and economizing by avoiding ruling on the other side of the ruling made by engraving plummet. Around the same time another Ashkenazic manuscript was written and ruled by engraving plummet.[124] The year 1304 is the first year from which an Italian manuscript ruled entirely by engraving plummet has survived, but in this case too, the technique was implemented on both sides of the unfolded bifolia,[125] as though the rulings were executed by a soft plummet – a technique that was not in use in Italy until the increase of immigration from Ashkenaz at the end of the fourteenth century. Close to this time, in 1311, in Tarquinia in Italy,[126] a manuscript was written which seems to have been ruled in its entirety by a mixed method that creates a compromise between the 'modern' use of soft coloured plummet (a technique that involves doubling the time investment, by using double pricking and ruling both sides of the folio or bifolium) and the traditional economical technique of hard point ruling only one side of the ruling unit. In this manuscript each bifolium was ruled separately unfolded on the hair side – precisely as though it were a hard point ruling, but the ruling instrument was a plummet rather than a stylus.[127]

The use of an engraving plummet as the sole instrument for complex rulings (including line and marginal rulings) was rare in Spain and in other zones, apart from Italy, and at any rate the relationship between this ruling technique and other techniques was very different in Italy compared to other zones. In the final quarter of the thirteenth century, the use of engraving plummet appeared in Italy in two manuscripts in which only the portal was ruled in this manner, and in one manuscript as a partial substitute for hard point ruling. The method used on a significant scale in Italian dated manuscripts from the first half of the fourteenth century onward was the compromise technique of ruling with an engraving plummet on one side only of the ruling unit - mainly on each unfolded bifolium (sometimes on each folio) on the hair side; the use of this method comprises a quarter of the parchment manuscripts that have survived from the first half of the

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[124] MS London Add. 9401–9402 (Margoliouth Catalogue 70). This manuscript was also ruled only by a hard plummet, but the frequency of its application was different.

[125] MS Parma Parm. 2151–2153 (De-Rossi Catalogue 3, Richler & Beit-Arié Catalogue [Parma] 10).

[126] MS Paris Hébreu 81 (see *Manuscrits médiévaux*, I, 29).

[127] It should be stressed that at times the pigments of the plummet lines are not visible at all in this manuscript, and only faint engraved lines can be discerned, and it may be that the pigments faded completely over time. Moreover, it is apparent that every so often the flesh sides of the bifolia were re-ruled because the plummet marks were not sharp enough to produce ridges on the other side.

century, 19 percent in the second half of the fourteenth century, 16 percent in the first half of the fifteenth century, and only 5 percent in the latter half of that century, during which most manuscripts were ruled in ink. These data include manuscripts in which this system was only partially implemented. These rates in Italy are somewhat greater (and significantly greater in the first half of the fourteenth century) from the rates of the use of the standard plummet on both sides of the bifolium or folio in Italian manuscripts (most of which were written by Ashkenazic immigrants). This technique of ruling therefore was the chief substitute for the hard point method, which had served as the standard technique in Italy from ancient times until the second half of the fifteenth century, during which the coloured ruling in ink spread and became equivalent to blind hard point ruling. It appears that indeed, Italian Hebrew bookcraft achieved in the use of the metallic engraving plummet a sort of compromise between the traditional use of hard point and the novel use of coloured ruling, and thus retained its loyalty to Italian conservatism while at the same time adapting to a contemporary innovation.

It should be stressed that ruling by engraving plummet on only one side of the folio or bifolium disrupted the identical appearance of the book's openings – i.e. the aesthetical symmetry of the ruled sides, which was produced by the relief system of ruling unfolded bifolia that were arranged with matching parchment sides, and, accordingly, also with matching ruled sides. This was because facing the page ruled with coloured ruling there was always (except in the centre opening of the quire and in the transition between quires when the unfolded bifolia were ruled separately) a page with blind ruling – the protruding ridges of the coloured rulings.

In all zones in which engraving plummet was used, it was also employed for partial rulings – the ruling of a frame or portal alone.

2c. Ruling with ink[128]

Coloured plummet rulings were adopted by Hebrew copyists at a much later date than they were adopted by Latin copyists, presumably due to the impact of the rejection of this technique for the writing of Tora scrolls on the ruling of other books (as described above in section 2a). Ruling lines in coloured ink guided by marginal prickings spread in Latin manuscripts in the thirteenth century at the latest (some two hundred years after

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[128] See Pasternak & Beit-Arié, 'Enigmatic Ruling Device'.

the first use of the plummet),[129] but this way of ruling, in which ink and pen replace the hard point, is not evidenced at all in medieval Hebrew manuscripts.[130] When the complete ruling in ink did appear, it was not the coloured ink characteristic of Gothic Latin manuscripts but a very light diluted ink, which is sometimes very hard to see. The ruling of the horizontal lines are not guided by rows of prickings, and they are visible only in manuscripts produced in Italy, in manuscripts made mostly of parchment and to a lesser extent also in paper ones, especially in the country's northern regions (Emilia Romagna, Lombardy, and a few also in Tuscany). Among dated Hebrew manuscripts, the earliest ruled in ink was written in Mantua in 1421,[131] and according to the many dated manuscripts from Italy from that century, it is reasonable to assume that there were no ink rulings in Hebrew manuscripts before the 1420s.

Since ink rulings in dated manuscripts are found only in those produced in Italy, this codicological trait can be used as a clear and easily visible criterion for identifying Hebrew manuscripts both in respect to provenance (Italy), and in respect to the chronological range of their production in the late Middle Ages (from the 1420s onward). One can say that this material trait is perhaps the most reliable criterion regarding these data in uncolophoned Hebrew manuscripts.

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[129] I am not aware of a clearer, more comprehensive presentation of data about the diffusion of ink rulings guided by prickings in non-Hebrew manuscripts.

[130] Note however that a number of scrolls from the Judaean desert were ruled with diluted ink. See Tov, *Scribal Practices*, p. 58 (where these scrolls are listed).

[131] MS New York MS 2391. The final two quires of MS Paris Hébreu 612 (see *Manuscrits médiévaux*, II, 59) were also ruled by ink in the same year at the same locality. The next occurrence of this innovative ruling method is in a manuscript from 1429 (MS Cambridge Add. 661) which was written in Cento. MS Parma Parm 720 (De-Rossi Catalogue 45) was ruled in ink some time before MS New York, since according to its colophon the manuscript was ostensibly written in 1419, but the colophon itself is problematic: the manuscript in question contains Levi ben Gershon (RaLBaG)'s commentaries on the Five Scrolls (see Richler & Beit-Arié Catalogue [Parma] 617). At the end of the book of Esther something resembling a colophon was written in 1419; it is formulated as a variant of the author's colophon to the commentary on the Book of Ruth dated 1329 (והיתה השלמתו לר' לוי בשנת שמונים ותשע)   :והיתה השלמתו לר' לוי טו בסיון קע״ט. RaLBaG did not write a colophon at the end of the Book of Esther. Could the anonymous scribe have inserted the date of his copying into the imitation of RaLBaG's colophon? It would seem that the scribe copied fron another commentary on the scrolls by RaLBaG that was written in Sienna, MS Parma Parm. 2180 (De-Rossi Catalogue). The latter commentary has a colophon at the end which reads as follows השלמת זה הפירוש מלוי בן גרשם היה בט״ו בסיון קע״ט לפרט, and our copyist mistook the the date for the completion by the author.
An examination of the dated manuscripts in the comprehensive survey of Latin Humanist manuscripts conducted by Derolez reveals that the earliest manuscript that was unmistakably ruled by ink using the new method was produced in Castelfiorinto in 1416 (see Derolez, *Codicologie*, vol. 2, no. 23), i.e. a few years before the first dated Hebrew manuscript that was ruled in this manner, but before 1430 this ruling technique appeared only in a few Humanist manuscripts.

During the first decades of its appearance in Hebrew manuscripts, the use of ink spread in Italy at a limited scale relative to other techniques – especially that of blind relief ruling, which was used as the standard and nearly exclusive ruling system in parchment manuscripts from the earliest ones in the eleventh century until the middle of the fifteenth century. In the 1420s and 1430s the first harbingers of ink rulings appeared in a small number of parchment manuscripts among the dated manuscripts; in the 1440s this type of ruling had increased to 22 percent of all parchment and paper manuscripts in the corpus, and to 29 percent of parchment manuscripts only; in the 1450s its rate of implementation shrank to 16 percent of all manuscripts and only 26 percent of parchment manuscripts; but from the 1460s its diffusion increased again to 29 percent of all manuscripts and almost half of all parchment manuscripts. In the final three decades of that century, its use had expanded greatly to comprehend almost half of all manuscripts and almost 80 percent of parchment manuscripts. From the 1420s to 1500 the rate of ink rulings in parchment manuscripts was twice that of paper manuscripts. The use of ink did not bypass the manuscripts produced by Sefardic, Ashkenazic, and Byzantine immigrants, and its distribution in these manuscripts diverges only slightly from its distribution in manuscripts produced by Italian copyists. As we shall see below, this fact carries valuable implications for understanding the manner of implementation of the ink technique.

In most manuscripts that used this technique between 1421 and 1500, only the horizontal lines were ruled in ink (82 percent), while the vertical bounding lines were ruled by plummet (the 'ink/plummet' method) or in rare cases, by hard point. Moreover, only in a rather small portion (17 percent) of all the dated manuscripts ruled in ink during this period, the entire ruling pattern – horizontal as well as vertical lines – were ruled in ink (the 'ink/ink' method).[132]

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[132] The distribution of techniques for marginal verticals ruling in the 1200 Humanist Latin parchment manuscripts in which the grid was ruled in ink differs from their distribution in Hebrew manuscripts. The following are the data presented by Derolez (*Codicologie,* vol. 1, p. 77): the marginal lines of around half of them were ruled by plummet, 8% were ruled by plummet on one side of the folio (a kind of engraving plummet?), 36% in ink, and 6% by hard point. The first Hebrew scribe to adopt entirely the technique of ink ruling in Italy was Yitsḥaq ben ʿOvadia of Forlì, a scribe who engaged with Humanist Christian society in Florence after settling there, and eventually appears to have converted to Christianity. He also produced the first extant dated manuscript in ink/ink ruling in 1441 (MS London Add. 19944-19945 [Margoliouth Catalogue 626-67]). In this manuscript Yitsḥaq also used the plummet to rule additional marginal lines as required by the changes to the textual layout, and sometimes also for reinforcing the marginal lines that had bee ruled in ink. For an extensive discussion, see Nurit Pasternak's dissertation, *Together and Apart*, chapter 6.

The ink rulings of horizontal lines in Italian parchment manuscripts are not guided by prickings as are relief rulings (or ruling made by engraving plummet). However, each of the vertical marginal lines that were ruled by plummet (but not by ink) were guided by single prickings – one in the upper margins and one in the lower margins – which often survived the trimming of margins on the occasion of rebindings. It is not merely the actual variation in the ruling technique and its instruments in the mixed coloured ruling system (ink for horizontal lines, plummet for vertical lines) that attests to its two-phase execution; pages that were left empty in the codex itself, at the head or end of the volume, which are ruled but not written on, also demonstrate clearly that the horizontals were first ruled in ink, and only later, following copying pace, it was pricked and the verticals added in plummet, for many empty pages display only the ink-ruled horizontal lines.[133]

The image below, from a manuscript written by Yitsḥaq ben'Ovadia in Mantua in 1435, illustrates the nature of ruling in bright and pale ink in Italy.[134]

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[133] This phenomenon may impact the validity of the hypothesis regarding wholesale production of ruled quires (see below) and the process of ruling. It is clear that the ruling of the marginal vertical lines by plummet was added by the copyists, but were the vertical boundary lines in the manuscripts which were also ruled in ink produced together with the ruling of the horizontal lines? If so, did Jews tend to buy quires in which only the horizontal lines were ruled? Perhaps the ink-ruled marginal lines were also added by the copyists? This could simplify our understanding of the nature of the ruling instrument (see below). According to Derolez (*Codicologie*, vol. 1, p. 78) prickings were made to guide the ruling of the vertical lines only in those manuscripts in which these lines were ruled by plummet. Indeed, in Hebrew manuscripts one finds prickings for guiding marginal lines only when these are ruled by plummet, whereas at the end of the marginal lines that were ink-ruled one does not find traces of prickings, and it therefore stands to reason that these lines were ruled with in the process of ruling the horizontal lines with the instrument whose nature eludes us.

[134] MS Vatican Ross. 555, fol. 292b: the beginning of the *Tur Ḥoshen Mishpat*, one of the four parts of the halakhic code *Arba'a Turim*.

In the early 1980s, Albert Derolez noticed that the Humanist ink-ruled manuscripts that he had examined revealed at times an unusual codicological phenomenon – a single pricking in the margin, usually the outer one, which does not match any of the horizontal ruled lines.[135] In an attempt to solve the mystery of the lack of guiding prickings for the horizontal lines and the existence of a single pricking, Derolez proposed a hypothesis regarding the possible existence of an unknown ruling instrument, which was created in order to mechanically orient all the horizontal ink rulings in mass-produced and mass-marketed pre-composed quires.[136] To undergird his

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[135] See Derolez, *Codicologie*, vol. 1, pp. 77-78). For a discussion of a few marginal single prickings that were recently discovered in different locations within Latin and Hebrew ink-ruled manuscripts, see above in the text referenced by n. 52 and in the note.

[136] Derolez also identified Humanist parchment manuscripts, especially in Toscana, which were ruled by hard point on each bifolium, without guidance by columns of prickings, and correctly concluded that these rulings are impressions executed by application of a ruling board (indeed, rulings of this type are also found in a few Hebrew parchment manuscripts). At the same time that Derolez recognized this possibility, Peter Gumbert observed visible single prickings in the outer margins of a number of 15th century ink-ruled manuscripts, especially in the Netherlands; following a suggestion by one of his students he ventured the hypothesis that these prickings indicate the use of a ruling instrument resembling a rake (see above, section a: Prickings, sub-section 'Single prickings', and Gumberts article, 'Ruling by Rake'). A scribal instrument of this sort may be depicted in a panel painting of St. Matthew made in 1478 and attributed to the painter Gabriel Mälesskircher, see P.F.J. Obbema, 'Scribes at Work', *Quaerendo*, 25 (1995), p. 287 & pl. 2. At any rate, this possibility was rejected by Rosenfeld, **'**Tools for Producing

hypothesis about wholesale production and construction of ink-ruled quires by copyists, Derolez made use of inventory lists and documents related to stationery stores (*cartolai*) from the period of the Italian Renaissance, which mention a ruled writing material and even empty ruled quires.[137] Some ten years earlier I had presented a similar hypothesis regarding the marketing of ruled quires prior to copying, for reasons related to the mobility of Jewish societies. To explain the astonishing fact that more than half of the ink-ruled Hebrew manuscripts in fifteenth century Italy were written in Sefardic and Ashkenazic scripts by immigrants from Germany, France, Provence, and Spain – regions in which ink had never been used for ruling Hebrew manuscripts – I suggested that these copyists purchased or had at their disposal pre-composed ruled quires or provided by those who commissioned the copying. This supposition also can explain the overwhelming and rapid assimilation to local practices, since the manuscripts written by immigrants in fact reflect the local characteristic mode of quiring (in quinions), which was hardly used at all in their countries of origin.[138]

Books', p. 170. It appears that a clue to the existence of an Italian rake-like ruling instrument is found in a Hebrew source from the sixteenth century, in the manuscript of a collection of letters in Ashkenazic script, written by a child of about ten in the region of Venice in the late 1560s. In one letter the boy asks his teacher to send him the books and a variety of writing implements that he had left with him, naming, among other items, pens, a sketchbook, various writing implements used for painting and music instruction, including an item called קלשון (qilshon):

במטו מינך מרא, הגיעני הפרוש רש״י שלי, שהוא גנוז בבית אדוני, והאטאוולאדורה > המלמד לאדם דעת והמדריכו לנגן היטב, ואף גם זאת, הספר הקטן שכתבתי וציירתי בו כתבים עד הנה, כמדומה לי שהוא תחת המטה בארגז >...< ועוד ספר אחד, שהוא מוטל ומונח בארון, **והקלשון** שלי והמאט <matita>, והשנים עשר בעלי מכחול >...< עוד אחלה את פני מ״כ לתקן לי קולמוסים.

Published and edited by S. Simonson, ''Olamo shel naʿar Yehudi biyemei haRenesans', *Hagut ʿIvrit be'Eropa*, ed. M. Zohori and A. Tartakover, Tel Aviv 1968/9, p. 343). The *qilshon* mentioned here was clearly an instrument used to rule several lines for writing, (or to draw a musical stave), and the Hebrew word *qilshon* (which means pitchfork) is a fitting name for such an instrument.

[137] To the proofs adduced by Derolez (*Codicologie*, vol. 1, p. 79) one can also add two pieces of evidence from Florence, which Nurit Pasternak has brought to my attention. See A. Garzelli, 'Note su artisti nell'orbita dei primi Medici: Individuazioni e congetture dai libri di pagamento della Badia fiesolana (1440–1485)', *Studi Medievali*, series 3, 26 (1985), pp. 468 (no. 126: 'quinterni 40 di carte rigate'), 469 (no. 133: 'per 20 quinterni di carte di caveretto da messale, righat'). The other evidence appears in an article by Albina de la Mare, 'New Research on Humanistic Scribes in Florence', in *Miniatura fiorentina del Rinascimento 1440–1525: Un primo censimento,* ed. A. Garzelli, Scandicci [Florence] 1985, vol. 1 , p. 410, note 96, and see Beit-Arié, *Unveiled Faces*, p. 27. n. 15. See also the listing in the inventory of the library of Avraham ben Elya from 1384/5 in which he notes that he personally purchased the quires for the copy of the maḥzor he commissioned (above, chapter , n. 190), thus supplying one of the earliest evidences (from a Jewish source) about the marketing and consumption of quired writing material.

[138] See Beit-Arié, *Hebrew Codicology*, pp. 107-109; for detailed data on the distribution of the use of ink ruling among immigrant scribes in Italy, see idem, *Makings*, pp. 67-70.

If these considerations do indeed support the hypothesis about wholesale production, marketing, and consumption of premade ruled quires, we are witness here to the beginnings of commercial mass-production of two investment-intensive components of the manual production of books in the late Middle Ages – the quiring and ruling of the writing material – to the modest emergence, as it were, of mechanical industrialization of a significant portion of the bookmaking process of hand-written books, before the advent of the mechanical print revolution, a pre-industrial development that accelerated the copying and distribution of books, presumably reducing the costs of production and abbreviating the duration of the production process. And yet, the assumption of wholesale production and retail consumption as well as the existence of a presumed ruling instrument are still doubtful. Foremost among these doubts is the question why, if indeed ruled quires were available on the market, have we not discovered among the hundreds documented Italian manuscripts shared ruling patterns, or at least a number of models displaying identical or somewhat uniform structures and dimensions. In fact, what we face is an astonishingly large variety of line spacing and numbers of lines, which do not coalesce into structural clusters, not even among manuscripts that were produced in the same place within a brief time span. Similarly, the assumption that there was wholesale production of ruled quires is dubious, because of the multi-layered manuscripts, containing, for example a core text in a square script and surrounded by columns of marginal commentaries in semi-cursive scripts, written on ink-ruled lines of varying spacing widths.[139] It is quite clear that such complex layouts were custom-made and not produced wholesale. There is no doubt that stationery stores sold ruled quires in the Renaissance and during the Humanists period, quires that were purchased from a producer possessing this expertise or that were produced in the stores themselves. In this case, the quires were likely to have been produced by uniform assembly lines or by a more flexible technique that could easily be adapted to the needs of the client and even to 'custom' orders.[140] Perhaps even the copyists themselves used

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[139] E.g. MS Paris Hébreu 50, a Pentateuch with Targum Onkelos and Rashi's commentary in the margins, including the Five Scrolls and Psalms, written in Mantua by two scribes and later vocalised in Mantua in 1496.

[140] An example of this can be found in MS Jerusalem Heb. 8° 4450, a maḥzor of Italian rite, copied by Leon ben Yehoshuaʻ (see above, chapter 2, n. 108). The pages of the maḥzor itself contain 20 ruled horizontals and the dimensions of its grid are 151 X 101 mm. The quires of fols. 162-199 (whose composition differs from that of the maḥzor's text) contain Maimonides *Shemona peraqim* written with a different layout: the commentary is written in a tiny script and the core text in a large script; the grid was altered for the sake of this copying – it contains 42 horizontals and its dimensions are 162 X 111

this technique, just as it is clear that they themselves usually added the vertical marginal lines by plummet. Whether this new ruling technique was the outcome of the copyists' personal initiative and private manufacturing or the result of a commercial enterprise, it is clear that it should be viewed as the embodiment of a mechanical system of ruling using an unknown template or ruling board, undoubtedly representing an advancement in European bookmaking processes, which had been preceded by some three hundred years by the system of ruling paper in the Orient

Examination of the rulings of hundreds of Hebrew manuscripts from the fourteenth and fifteenth centuries, which were produced in Europe on paper (or mixed parchment and paper) after the diffusion of the use of paper as writing material, reveals that they were ruled by blind relief without guiding prickings. It should therefore be assumed that the use of some kind of ruling board or frame was widespread in Europe also – not necessarily for the mechanical ruling of lines, but certainly for guiding the rulings,[141] as described above in detail in section 1.b.1. This phenomenon of unguided relief ruling, which also appears in a few parchment manuscripts, is especially conspicuous in the zones of Sefardic book culture and its outposts, and it is also common in Italy. The use of an unknown frame for the guiding of the ruling of paper folios presumably did not significantly reduce the amount of time invested in ruling the lines, but relieved the copyists of the task of pricking the quires.[142]

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mm. The alteration of the composition of the quires affirms the conclusion that the ruled quires were purchased 'by size' and according to the needs of the copying and the layouts of the texts.

[141] In this context, one should mention Muzerelle's suggestion that the ruling of horizontal lines by plummet on each page separately without guidance by marginal prickings except for a single pricking hole could only have been executed by a moving ruler whose width was adjusted to the desired spacing between lines (see above, n. 21). His hypothesis may also explain the riddle of the Italian technique of ruling with a pale ink seen in Humanist and Hebrew manuscripts, without needing to speculate that the rulings were mass-produced by a mechanical means. Although one can correctly assume that it is difficult to rule with a wet ink in this manner without it smearing, the phenomenon seen sometimes in Hebrew manuscripts in which the ends of ruled lines bend at the beginnings of the lines (indicating that they were ruled from left to right) could be explained by this hypothetical technique.

[142] It should be further remarked that the itemisation of the manuscript's production costs, recorded by the scribe of the abovementioned MS Moscow, chapter 6, n. 5 – a paper manuscript that was ruled in relief without guiding prickings – demonstrates that the ruling was not executed by the scribe but was a distinct production phase whose cost was included in the list of expenses such as the writing material and the copyist's fee.

Regional summary of ruling practices and their transformations [143]

The Middle East

Parchment manuscripts produced in the Middle East were pricked on the outer margins quire by quire when folded, and were ruled on the flesh side by hard point, each unfolded bifolium separately. Subsequent to the ruling, the bifolia were stacked with matching sides – hair side facing hair side, and flesh side facing flesh side – so that each opening of the book displayed only one side of the parchment – hair or flesh alternately, and thus the ruled side also obtained a uniform appearance – furrows (in the flesh side openings) or ridges (in the hair side openings).

Early dated paper manuscripts (produced in the eleventh century), whose rulings are visible, were ruled in an almost identical manner to the parchment manuscripts: the ruling of the lines was also guided by outer margin prickings, and each unfolded bifolium was ruled on one of its sides. Unlike the parchment manuscripts, in which the matching of the sides allowed the book's opening to also display a correspondence of the ruled sides, the paper quires were not arranged with matching furrows and ridges.

Later paper manuscripts that were produced since the twelfth century on were ruled with a ruling board, each folio separately, and usually the direct ruling is imprinted on the verso sides. And yet, one finds that more than a quarter of the dated manuscripts that were written in the Middle East before 1500 were ruled by hard point, page by page.

Ashkenazic zones

Only a few manuscripts written in France and German lands were produced on paper prior to the fifteenth century, during which the use of paper as a writing material spread in Germany. Parchment manuscripts display an evolutionary development that was not economical, but arose, apparently, from functional needs. The salient transformation in ruling practices cannot be separated from the transformation of the method of processing parchment and the appearance of its sides, and therefore the writing material

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[143] Developments in the methods of ruling and their vicissitudes from an economic and ergonometric point of view are summarized below, Afterword, section 2.a: production techniques, and see also in detail: Beit-Arié, *History of Production*, pp. 4-7 [216-219]; idem, *Unveiled Faces*, pp. 18-31.

is also integral to the characterization of the Franco-German ruling and its transformations. The development allows unmistakable chronological conclusions to be deduced, and the aspect of the processing of parchment in this development also has valuable geographical implications for our ability to differentiate between manuscripts written in France and those written in Germany – the twin regions that share codicological traits, scripts styles, and book design.

The manuscripts written in France and Germany until the last third of the thirteenth century were produced on parchment that preserved to a greater (particularly in the early period) or lesser extent the natural differences between the sides, and the bifolia in their quires were arranged according to matching sides, which are easily visible.

During these time periods, for the guiding of the rulings, the quire's bifolia were pricked on the outer margins only, and each bifolium was ruled unfolded by hard point on the hair side. Plummet was occasionally used for auxiliary rulings.

After the last third of the thirteenth century the processing of parchment underwent a change. In the German lands, almost without exception, it became standard to use equalised parchment – a phenomenon whose rudiments had appeared earlier – and subsequently the sides became indistinguishable. But this is not the case in France, where fully equalised parchment was not in use, or where the differences between the sides were merely reduced; in almost all of the dated manuscripts produced there it is possible (sometimes with difficulty) to distinguish between the hair and flesh side. In the same time period, these two regions experienced a conspicuous transformation of the ruling technique and of the various components of the standard ruling system. The rulings were usually guided by pricking both the outer and inner margins, a practice that emerged at the very latest in the first third of the thirteenth century, but which spread rather slowly before the 1280s. Indeed, in the final two decades of the thirteenth century and the beginning of the fourteenth century, less than a mere one-seventh of the dated manuscripts were pricked in the traditional manner in the outer margins only. However, the traditional pricking method was not entirely supplanted by the new technique, and its rate of usage grew in the fourteenth century to as much as a third of the manuscripts, rising to nearly one half by the late Middle Ages.

There is no doubt that the major revolution in the ruling techniques was the transition from economical relief (blind) rulings by hard point to coloured rulings by plummet, a method that had at first been rejected, seemingly due to considerations of Jewish law, but that later was adopted, presumably because it permitted flexible and dynamic

rulings that were put to the service of copying of literary genres comprising multiple integrated textual components. Apart from some partial auxiliary usages of plummet in manuscripts as early as the twelfth century, the systematic use of coloured plummet in the Franco-German zone spread quite rapidly during the final third of the thirteenth century. Already during this time, coloured ruling became standard, and only a quarter of the manuscripts were still ruled by hard point in the traditional relief way. During the fourteenth and fifteenth centuries coloured plummet rulings became even more common in Ashkenazic manuscripts, and appear in 94 percent of dated parchment manuscripts (some of which display mixed rulings using both hard point and standard plummet); an additional 3 percent were ruled by engraving plummet, and only close to 6 percent of parchment manuscripts still used traditional relief rulings by hard point. It should be emphasized that only a small number of manuscripts written on equalised parchment in the fourteenth and fifteenth centuries – all of them undoubtedly from the German lands and its environs – were ruled not by plummet but by hard point.

During the period of transition from the old methods of processing parchment and old ruling techniques to the new, slowly emerging methods during the thirteenth century, and in particular during the last four decades of that century – the old and new methods of production were used in combination, but the new methods of production became increasingly widespread. Due to the inability to distinguish between the parchment sides, the bifolia of these manuscripts were arranged by matching ruled sides, with alternating openings of furrows or ridges.[144] One also finds hybrid usages of pricking

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[144] However sometimes manuscripts of this kind were not arranged by matching rulings, e.g. MS Paris Bibliothèque Mazarine 4472, *Sefer Mitzvot Gadol* with the author's colophon (for the dating of the copying), see above, n. 106).

methods and rulings within a single manuscript[145] and even differences between scribes who participated in the copying of a single manuscript.[146]

The manuscripts that were pricked according to the new system in both outer and inner margins were ruled page by page, whereas the manuscripts that were pricked according to the old method in the outer margins only were ruled according to the old method, each unfolded bifolium separately; but, unlike in the engraving method, both sides of the bifolium were ruled. Ruling by plummet seems to have been dependent on the pricking method, but perhaps the reverse is true, and the pricking method was dictated by the new ruling method. The latter assumption is contradicted by the quantitative data: although pricking of both margins spread along with the increased usage of coloured plummet rulings during the last two decades of the thirteenth century and the beginning of the fourteenth century, around half of the French manuscripts in the ensuing decades of the fourteenth century and half of the German manuscripts in the fourteenth and fifteenth centuries continued the old tradition of pricking the outer margins only; in other words, even when the practice of plummet ruling was well under way, the practice of ruling the outer margins only was still alive. If so, the change in the method of pricking cannot be ascribed to the mere transition to a new technique of plummet rulings. At the same time, it should be stressed that among the fourteenth

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[145] An instructive example of the hybridisation of the old and new traditions of processing the parchment and of the techniques of pricking and ruling can be seen in MS Parma Parm. 2924 (De-Rossi Catalogue 60), a Hebrew-French biblical dictionary (a glossary of foreign words in the Hebrew text) copied in Delsberg (or as known by its ancient name, Thalisperc) in 1279. The entire manuscript was pricked in the outer margins; one quire, however (fols. 135-142) was pricked in both inner and outer margins. The first seventeen quires (fols. 1-134) and an additional quire (fols. 175-180) were written on equalised parchment, and the remaining ten quires (fols. 135-174, 181-217) were made of a more delicate parchment whose sides are easily distinguished. All of the quires were ruled by hard point with the exception of three which are ruled by plummet: the quires made of parchment with differentiated sides were ruled on each unfolded bifolium separately on the hair side, except for two —the quire that was pricked on the inner margins as well was also ruled by hard point on the hair side, but presumably folio by folio, and one quire (fols. 197-204) was ruled by plummet, each bifolium on both sides; the quires made of equalised parchment were also ruled by hard point and their bifolia were arranged by matching ruled sides, each quire beginning with the side that was not directly ruled (except for the quire of fols. 44-51), except for two quires that were ruled by plummet, each bifolia separately on both sides (fols. 25-43). Sometimes the scribe used the plummet to re-rule the other side of bifolia that were ruled by hard point.

[146] An example of this is already evidenced in the manuscript in which double margin ruling first appeared in Ashkenaz, MS Munich, Cod. Hebr 5 (see above, section a: pricking, in the next referenced by note 43), which was copied in 1232/3 in Germany. The quires copied by the main scribe were pricked on both margins, whereas the quires copied by the secondary scribe were pricked only in the outer margins.

century manuscripts that were pricked in the outer margins, the proportion of those that were ruled by plummet is much smaller than of those ruled by engraving, and there is no doubt that the standard practice was coloured plummet ruling guided by rows of prickings on either side of the written area, while the majority of manuscripts ruled by engraving were pricked in the outer margins only.

Since the time of the earliest manuscripts one observes two closely spaced prickings (instead of one) for special lines – one or two lines of the three upper, central and bottom lines. The double pricks mark where through-lines should be drawn across the width of the page or the unfolded bifolium, serving like structural axes of the ruling grid. This tradition appears in almost half of the dated manuscripts written on parchment before 1500, and in 57 percent from the fourteenth century.

Usually, the number of ruled lines exceeded the number of written lines by one, and the letters were written between the two ruled lines (and not by suspending the letters from the ruled line in the manner of Hebrew writing in other zones) sometimes close to the upper line and sometimes in the middle of the interlineal space.[147] By this method, the written area was framed on all sides. Since Hebrew writing (like Greek and later Arabic writing) suspends downward from the ruled line, the additional line was added at the bottom of the ruling. This phenomenon has an inverted parallel in Latin manuscripts, whose scripts are written above the ruled line. When the Gothic script first appeared an additional line was added above the first line.[148]

Manuscripts produced on paper were ruled by hard point and sometimes by plummet. Only a fifth of them display rulings that were unguided by prickings but were presumably ruled by some sort of ruling boards, whereas in the remainder of the manuscripts only the boundaries of the written area were mainly ruled – frames or portal-like ruling, almost half of which were guided by single pricks, or vertical boundary lines, many of which were also presumably guided by single prickings at the edges of the folios; these prickings, however, were trimmed subsequently when worn bindings were replaced.

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[147] See also Glatzer's description ('Aleppo', pp. 204-205, n. 12) which is based on halakhic writings pertaining to the writing of ritual scrolls.

[148] See N.R. Ker, 'From "Above Top Line" to "Below Top Line": A Change in Scribal Practice', *Celtica*, 5 (1960), pp. 13–16 [=idem, *Books, Collectors and Libraries – Studies in the Medieval Heritage*, ed. A.G. Watson, London–Roceverte, W. Va. 1985, pp. 71–74]. The sublinear writing was renewed in the Humanist manuscripts, especially in northwest Italy, see Derolez , *Codicologie*, vol. 1, p. 83.

In parchment manuscripts, prickings appear in the outer and inner margins in all[149] of the extant early dated manuscripts prior to 1266, including manuscripts written by Maghrebi and Spanish immigrants in the Middle East at the end of the tenth century and the beginning of the eleventh century.[150] Double margin pricking was the norm in most manuscripts in the fourteenth century too, and conspicuously so until the middle of that century. The earliest Sefardic manuscript that has survived with outer margin prickings only[151] dates from 1271, and by the end of the century the new technique spread quickly and encompassed a quarter of the dated manuscripts, however, it continued to be a secondary technique to the double margin prickings.

Not a few manuscripts from the middle of the fourteenth century onwards, and in particular from the last quarter of the fifteenth century, which were ruled folio by folio, were not pricked at all, and the rulings appear to have been guided by a template or were ruled mechanically by a ruling board.

The standard ruling in these regions throughout all the time periods was by hard point on the hair side: in manuscripts that were also pricked in the inner margins several folios were ruled in one go – usually two but sometime more, and sometimes this same method was applied to two unfolded bifolia arranged according to their sequence in the quire.[152] The ruling of pairs of folios or bifolia in one go was in use chiefly at the end of the thirteenth century, but it became increasingly less prevalent over time. In the thirteenth century, the hard point ruling of two folios (or bifolia) was used in 60 percent of Sefardic parchment manuscripts; in the fourteenth century, the rate declined to one third of all manuscripts, while in the fifteenth it dropped to one quarter. Nonetheless, the ruling of two successive folios in one go was used in more than a third of all the manuscripts from all periods prior to the Spanish expulsion, and there is no doubt that it should be seen, along with its sister practice of ruling two successive bifolia as the

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[149] With the exception of the earliest extant manuscript from the Sefardic zones, which was written in Tunisia between 941 and 1039, where, as mentioned, only the outer margins have prickings. And see above in the text referenced by n. 76.

[150] The earliest manuscript written in the Sefardic zones showing double margins prickings, appears to have been written in North Africa in 1123. See *Codices hebraicis*, Part III, Manuscrit 63. And see also above, in the text referenced by n. 37 and in the note.

[151] MS Cincinnati, HUC 653. Naturally, each bifolium was ruled unfolded.

[152] In a number of manuscripts that ruling unit was a folded bifolium, i.e. two non-consecutive folios but not in their location in the quire.

characteristic ruling method of Sefardic book culture. Quite frequently the copyist re-ruled the ruled lines which were insufficiently visible (all of them or only the vertical margins), especially on the fourth page of a pair of folios and on the fourth side of a pair of bifolia that were ruled together, sometimes using plummet, and at times it appears that pairs of folios were initially ruled twice – on the first and fourth pages (in both cases on the hair side).

Already from the beginning of the thirteenth century one can observe the rudiments of the use of ruling methods that deviate from the economical Sefardic method of ruling folios or bifolia in one go, methods that subsequently became rather widespread. These manuscripts were ruled by hard point, each unfolded bifolium separately on the hair side (the abovementioned manuscript from 1271 is the earliest dated manuscript to be ruled in this manner, and it is also the first that was pricked in the outer margins only), or each folio separately[153] on the recto or verso without consideration to which side of parchment was ruled, or on the hair side only.[154] Although the pricking method most appropriate to the bifolium as a ruling unit is the pricking of the outer margins, many of these manuscripts were ruled one bifolium at a time, and were pricked on both other and inner margins – a demonstration of the force of tradition or perhaps an indication that the prickings were not made by the copyist himself, but that the bifolia were pricked in advance according to the conventional pricking tradition.

Paper manuscripts in these zones were ruled in relief technique, each folio separately (usually on the verso), displaying what appears as rather feeble engravings. However, the lack of pricking to guide the lines and the margins suggest that they were in fact ruled with the aid of a ruling board and not by hard point

Italy

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[153] To a very conspicuous degree in the second half of the fifteenth century.

[154] In a number of manuscripts, especially those produced in Toledo in the second half of the thirteenth century, each page was gently ruled separately. Several manuscripts, especially from the final quarter of the thirteenth century – the time of the diffusion of coloured ruling in Ashkenaz – were ruled by plummet or by engraving plummet. Naturally, in Spain too one finds not a few manuscripts which were produced using hybrid codicological techniques, especially during periods of transition between the old pricking and ruling practices and the practices that supplanted them. An instructive example of such hybridity can be seen in MS Amsterdam, Etz Hayyim Library A 1-2, written in Narbonne in 1282. This fine manuscript was pricked in the outer and inner margins and was ruled in three ruling units – pairs of leaves according to their sequence in the quire, pairs of unfolded bifolia, and single unfolded bifolia. A few quires of the first volume exhibit double pricking as in the Ashkenazic tradition.

The standard ruling method used in the Italian parchment manuscripts throughout the Middle ages and until the fifteenth century was the pricking of outer margins only and blind ruling by hard point, each unfolded bifolium separately on the hair side.[155]

The partial use of engraving plummet that left its colours on the furrowed side of the bifolium (the hair side), and its blind ridges on the flesh side began as early as the final quarter of the thirteenth century in a few manuscripts and later spread to a limited extent. Even when the basic ruling was in hard point, partial use of engraving plummet can be discerned, and it seems that this served as an alternative to the standard ruling until the middle of the fifteenth century. At the peak of the use of this technique, during the first half of the fourteenth century, nearly a quarter of manuscripts were ruled either partially or entirely in this fashion. A small number of manuscripts from the second quarter of the fourteenth century onward were entirely ruled by plummet, and most of them were written by Ashkenazic immigrants. Engraving plummet or regular plummet was generally used to rule frame lines or margins.

In the beginning of the 1420s, especially in northern Italy, the conservative Italian copyists gradually adopted a new ruling technique that was widely used in Humanist manuscripts, which appears to have been mass-produced mechanically by means of some kind of ruling instrument: the ruling was no longer guided by rows of prickings, and the lines were ruled in pale ink on each page separately. The vertical boundary lines were ruled in most manuscripts by plummet (only in one sixth of the manuscripts were they also ruled in ink) and were guided by single prickings in the upper and bottom margins, indicating that the copyist had added them later. Sometimes single pricking marks survived in the margins of the written area, and these are apparently traces of the use of a ruling instrument. The technique slowly spread to both parchment and paper manuscripts until the 1460s, but became a widespread technique in the final three decades of the fifteenth century, supplanting the blind ruling by hard point which of course, was implemented only on parchment manuscripts whose numbers were dwindling.

Byzantium

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[155] On the characterisation of the Italian practices and their vicissitudes See also my article, 'Towards a Comparative Typology of Italian Hebrew and Latin Codices' (above, n. 11), pp. 377-396.

In the few dated parchment manuscripts that have survived from Byzantium from the middle of the thirteenth century and the fourteenth century, and in a few from the fifteenth century one find prickings in the outer margins only and the hard point ruling of unfolded bifolia on the hair side. A larger number of fifteenth century manuscripts contain no prickings at all; they were ruled by hard point, each folio separately on either side, suggesting that the ruling was guided by a ruling board. In many paper manuscripts (including mixed parchment and paper ones) prickings guiding the frame or vertical boundary lines often have survived. In many completely ruled paper manuscripts rulings it appears that the lines were ruled by hard point, each folio separately, but the lack of guiding prickings suggests that they were ruled with a ruling board, and this conclusion is self-evident in a number of manuscripts.

Tables 23-25: Summary of pricking and ruling practices

Table 23: Types of prickings used to guide the rulings in parchment manuscripts

Pricking in the outer margins only	The Middle East Italy Ashkenazic zones – standard until the final third of the thirteenth century Sefardic zones – from 1271 onwards, secondary to double margin pricking
Pricking in the outer and inner margins	Sefardic zones – standard until 1271; frequent afterwards Ashkenazic zones – increasingly widespread from the final third of the thirteenth century
Double pricking for through lines	Ashkenazic zones – frequent, less so in the 15th century Italy – rare, especially in manuscripts written by Ashkenazic immigrants
Prickings for vertical boundary lines only; single prickings in the margins	Italy – in ink-ruled manuscripts and vertical lines by plummet Traces of single prickings in the margins of ink rulings, apparently made by the ruling instrument

Table 24: Techniques of ruling in parchment manuscripts

Blind relief ruling by hard point of unfolded bifolia on the hair side	Italy – standard until the middle of the 15th century Ashkenazic zones – standard until the last third of the thirteenth century; in the fourteenth and fifteenth centuries to a limited extent Byzantium Sefardic zone – from 1271 as a secondary mode to the ruling of two folios in one go
Blind relief ruling by hard point of unfolded bifolia in the flesh side	The Middle East

Ruling by hard point each two folios (or bifolia) in one go on the hair side	Sefardic zones in all time periods, standard before 1271, prevalence later decreases gradually
Coloured plummet ruling, each page separately or each unfolded bifolium separately on both sides	Ashkenazic zones – auxiliary use from the end of the twelfth century; full use from the final third of the thirteenth century
Hybrid coloured and relief ruling by engraving plummet on one side of the folio or bifolium	Quite frequent in Italy in the fourteenth century and in the first half of the fifteenth century Rare in Ashkenazic and Sefardic zones
Coloured ink ruling, apparently with the aid of a ruling instrument (frequently the vertical boundary lines are ruled by plummet)	Italy from the 1420s and especially in the final three decades of the fifteenth century. The same ruling appears in paper manuscripts
Special through lines ruled across the width of the page or unfolded bifolium from one end to the other	Ashkenazic zones in all time periods, but less so in the fifteenth century

Table 25: Modes of pricking and ruling in paper manuscripts

Pricking	Middle East – prickings for lines and vertical marginal lines in the eleventh century (as in the parchment manuscripts) Europe – prickings for the frame or portal drawing or for vertical marginal lines only or without prickings Italy – in the fifteenth century pricking for verticals boundary lines drawn in plummet in ink-ruled manuscripts Traces of single prickings in the margins of ink rulings (as in the parchment manuscripts ruled in this manner)
Ruling with ruling board (mastara/mistara)	The Middle East – mechanical relief blind ruling with a ruling board (mastara/mistara) that imprinted lines on paper folios, usually on the verso. The technique is evidenced in at least half of the Oriental manuscripts
Relief blind ruling by hard point	The Middle East – apparently, in the half of the manuscripts, although the distinctions between rulings produced by a board and those by hard point are unclear, and some of the ruling may have been made by ruling board, as suggested by the absence of pricking

Relief blind ruling by a ruling board (European)	Spain, Italy and Byzantium – apparently, in manuscripts lacking guiding prickings with rulings on each folio which are regular, uniform and flat
Complex ink ruling (ink/ink) or ruling of lines in ink and marginal lines by plummet (ink/plummet)	Italy – see parchment rulings

Tables 26-34: Diffusion of pricking and ruling practices

For the general basis for the statistical calculations and their presentation in the tables below, see above, in the introduction in the section on the 'General statistics of the database' (at the top of table 5). The statistics presented in the tables below are based on a corpus of dated manuscripts prior to 1500 which encompasses all of the parchment and paper manuscripts. In Table 26-27, which relate to the diffusion of pricking practices in parchment manuscripts only manuscripts with guiding prickings in their outer margins or in their outer and inner margins were counted. At times two modes of pricking appear in the same manuscript; in such cases, it is counted twice. However, in a large number of the manuscripts in this corpus, no guiding prickings have been found, whether because prickings made in the outer margins only were trimmed during binding or rebinding, or whether no guiding prickings were made because only frames and vertical marginal lines were ruled, or because they were ruled with a ruling board, etc. As a result, the total sum of manuscripts in the regional corpora and in the corpus in general is larger than the sum of manuscripts with pricking in the outer margins and in the outer and inner margins in those same regions, and generally.

In the tables pertaining to the distribution of ruling techniques in parchment manuscripts (Table 30-31), the calculations of the total sums of the manuscripts counted per each practice by region and period or total may deviate from the sum total of all the manuscripts in the corpus in those same regions and time periods or in total (and the sum of their percentages may also deviate from 100%), because at times several ruling techniques were used in combination in one manuscript, and each was counted separately. In paper manuscripts (Table 32) there are even times when manuscripts in which it is difficult to determine whether they were ruled by hard point or with a ruling board are counted twice. Although a few of the paper manuscripts have been counted more than once according to the number of ruling techniques each displays, the total sums of these manuscripts by region are smaller than the total sum in the corpus, unlike the case of parchment manuscripts, because some paper manuscripts were not ruled at all but are still included in the total number of manuscripts in the corpus.

The following symbols are used in Table 26-34:
number of manuscripts   % percentage of the total regional corpus.

Table 26: The regional diffusion of types of pricking in parchment manuscripts only

(1) pricking in the outer margins   (2) pricking in the outer and inner margins

Region	1 #	1 %	2 #	2 %	Total in corpus
Sefarad	41	21	95	48	197
Ashkenaz	106	39	154	56	274
Italy	215	44	19	4	484
Byzantium	10	31	1	3	32
Orient	11	39	5	18	28
Yemen	9	64	0	0	14
Unidentified	6	75	1	13	8
Total	398	38	275	27	1037

Table 27: The geo-chronological diffusion of types of pricking in parchment manuscripts only

(1) pricking in the outer margins   (2) pricking in the outer and inner margins

Region - period	1 #	1 %	2 #	2 %	Total in corpus
Sefarad 1001-1100	2	100	0	0	2
Sefarad 1101-1200	0	0	4	100	4
Sefarad 1201-1300	12	25	36	75	48
Sefarad 1301-1400	14	20	41	59	70
Sefarad 1401-1500	13	18	14	19	73
Ashkenaz 1101-1200	3	75	1	25	4
Ashkenaz 1201-1300	28	41	38	56	68
Ashkenaz 1301-1400	37	30	81	66	122
Ashkenaz 1401-1500	38	48	34	43	80
Italy 1001-1100	2	100	0	0	2
Italy 1101-1200	2	100	0	0	2
Italy 1201-1300	31	67	1	2	46
Italy 1301-1400	75	65	3	3	115
Italy 1401-1500	105	33	15	5	319
Byzantium 1101-1200	1	50	0	0	2
Byzantium 1201-1300	2	100	1	50	2
Byzantium 1301-1400	4	31	0	0	13
Byzantium 1401-1500	3	20	0	0	15
Orient 894/5 (?)	1	100	0	0	1
Orient 901-1000	5	45	1	9	11
Orient 1001-1100	2	33	2	33	6
Orient 1101-1200	1	25	1	25	4
Orient 1201-1300	1	20	1	20	5
Yemen 1201-1300	2	67	0	0	3
Yemen 1301-1400	3	100	0	0	3
Yemen 1401-1500	4	50	0	0	8
Unidentified 1101-1200	2	100	0	0	2
Unidentified 1301-1400	2	100	1	50	2
Unidentified 1401-1500	2	50	0	0	4
Total	**398**	**38**	**275**	**27**	**1037**

Table 28: The regional diffusion of types of double pricking marking through lines in parchment manuscripts only

Region	#	%	Total in corpus
Sefarad	3	2	**197**
Ashkenaz	125	46	**274**
Italy	12	2	**484**
Byzantium	0	0	**32**
Orient	0	0	**28**
Yemen	0	0	**14**
Doubtful	1	13	**8**
Total	141	14	**1037**

Table 29: The geo-chronological diffusion of double pricking marking through lines in parchment manuscripts only

Region Period	#	%	Total in corpus
Sefarad 1001-1100	0	0	2
Sefarad 1101-1200	0	0	4
Sefarad 1201-1300	0	0	48
Sefarad 1301-1400	2	3	70
Sefarad 1401-1500	1	1	73
Ashkenaz 1101-1200	2	50	4
Ashkenaz 1201-1300	31	46	68
Ashkenaz 1301-1400	69	57	122
Ashkenaz 1401-1500	23	29	80
Italy 1001-1100	0	0	2
Italy 1101-1200	0	0	2
Italy 1201-1300	1	2	46
Italy 1301-1400	2	2	115
Italy 1401-1500	9	3	319
Byzantium 1101-1200	0	0	2
Byzantium 1201-1300	0	0	2
Byzantium 1301-1400	0	0	13
Byzantium 1401-1500	0	0	15
Orient 894/5(?)	0	0	1
Orient 901-1000	0	0	11
Orient 1001-1100	0	0	6
Orient 1101-1200	0	0	4
Orient 1201-1300	0	0	5
Orient 1301-1400	0	0	1
Yemen 1201-1300	0	0	3
Yemen 1301-1400	0	0	3
Yemen 1401-1500	0	0	8
Unidentified 1101-1200	0	0	2
Unidentified 1301-1400	1	50	2
Unidentified 1401-1500	0	0	4
Total	141	14	1037

Table 30: The regional diffusion of ruling techniques in parchment manuscripts only

(1) Relief rulings (blind ruling, usually by hard point)
(2) Rulings with an engraving plummet (blind coloured ruling)
(3) Plummet rulings (coloured rulings)
(4) Ink rulings (coloured rulings)

Region	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	Total in Corpus
Sefarad	177	90	12	6	11	6	0	0	**197**
Ashkenaz	48	18	11	4	226	82	0	0	**274**
Italy	283	58	70	14	34	7	132	27	**484**
Byzantium	28	88	0	0	0	0	0	0	**32**
Orient	25	89	0	0	0	0	0	0	**28**
Yemen	14	100	0	0	0	0	0	0	**14**
Unidentified	3	38	1	13	3	38	0	0	**8**
Total	**578**	**56**	**94**	**9**	**274**	**26**	**132**	**13**	**1037**

Table 31: The geo-chronological diffusion of ruling techniques in parchment manuscripts only

(1) Relief blind ruling (usually by hard point) (2) Engraving plummet (coloured and relief)
(3) Plummet ruling (coloured rulings) (4) Ink ruling (coloured ruling)

Region – Period	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	Total in Corpus
Sefarad 1001-1100	2	100	0	0	0	0	0	0	**2**
Sefarad 1101-1200	4	100	1	25	0	0	0	0	**4**
Sefarad 1201-1300	44	92	3	6	3	6	0	0	**48**
Sefarad 1301-1400	59	84	5	7	7	10	0	0	**70**
Sefarad 1401-1500	68	93	3	4	1	1	0	0	**73**
Ashkenaz 1101-1200	4	100	1	25	0	0	0	0	**4**
Ashkenaz 1201-1300	33	49	3	4	36	53	0	0	**68**
Ashkenaz 1301-1400	7	6	6	5	115	94	0	0	**122**
Ashkenaz 1401-1500	4	5	1	1	75	94	0	0	**80**
Italy 1001-1100	2	100	0	0	0	0	0	0	**2**
Italy 1101-1200	**2**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Italy 1201-1300	44	96	2	4	2	4	0	0	**46**
Italy 1301-1400	95	83	27	23	5	4	0	0	**115**
Italy 1401-1500	140	44	41	13	27	8	132	41	**319**
Byzantium 1101-1200	2	100	0	0	0	0	0	0	**2**
Byzantium 1201-1300	2	100	0	0	0	0	0	0	**2**
Byzantium 1301-1400	11	85	0	0	0	0	0	0	**13**
Byzantium 1401-1500	13	87	0	0	0	0	0	0	**15**
Orient 894/5 (?)	1	100	0	0	0	0	0	0	**1**
Orient 901-1000	10	91	0	0	0	0	0	0	**11**
Orient 1001-1100	4	67	0	0	0	0	0	0	**6**
Orient 1101-1200	4	100	0	0	0	0	0	0	**4**
Orient 1201-1300	5	100	0	0	0	0	0	0	**5**
Orient 1301-1400	1	100	0	0	0	0	0	0	**1**
Yemen 1201-1300	3	100	0	0	0	0	0	0	**3**
Yemen 1301-1400	3	100	0	0	0	0	0	0	**3**
Yemen 1401-1500	8	100	0	0	0	0	0	0	**8**
Unidentified 1101-1200	2	100	0	0	0	0	0	0	**2**

Unidentified 1301-1400	0	0	1	50	1	50	0	0	**2**
Unidentified 1401-1500	1	25	0	0	2	50	0	0	**4**
Total	**578**	**56**	**94**	**9**	**274**	**26**	**132**	**13**	**1037**

Table 32: The geo-chronological diffusion of ruling techniques in paper manuscripts

(1) Relief ruling (by hard point or presumed ruling board)
(2) Ruling with an engraving plummet
(3) Plummet ruling
(4) Ink ruling
(5) Relief impressed ruling made by *mastara* ruling board

Region	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	5 #	5 %	Total in Corpus
Sefarad	316	91	3	1	6	2	0	0	4	1	**347**
Ashkenaz	26	46	9	16	18	32	2	4	0	0	**56**
Italy	206	66	17	5	51	16	36	12	0	0	**313**
Byzantium	139	76	6	3	6	3	0	0	4	2	**184**
Orient	92	28	0	0	0	0	0	0	157	48	**325**
Yemen	37	40	0	0	0	0	0	0	57	62	**92**
Unidentified	10	71	1	7	1	7	0	0	0	0	**14**
	826	**62**	**36**	**3**	**82**	**6**	**38**	**3**	**222**	**17**	**1331**

Table 33: Ink rulings in Italy in the decades 1421—1500 in parchment manuscripts only

Period	#	%	Total in corpus
1421–1430	3	11	**28**
1431–1440	3	15	**20**
1441–1450	7	29	**24**
1451–1460	8	26	**31**
1461–1470	17	52	**33**
1471–1480	42	82	**51**
1481–1490	33	72	**46**
1491–1500	22	81	**27**
Total	**135**	**52**	**260**

Table 34: Ink rulings by type in Italy in the decades 1421—1500 in parchment and paper manuscripts

(1) Ink rulings (line rulings or line and margins rulings)
(2) Line rulings in ink, vertical margins ruled by plummet (ink, plummet)
(3) Complete rulings in ink (ink, ink)
(4) Line rulings in ink, vertical margins ruled by engraving (ink, engraving)

Period	1 #	1 %	2 #	2 %	3 #	3 %	4 #	4 %	Total in Corpus
1421–1430	3	7	3	7	0	0	1	2	**45**
1431–1440	3	8	2	5	1	3	0	0	**39**
1441–1450	9	22	7	17	2	5	0	0	**41**
1451–1460	10	16	7	11	2	3	1	2	**64**
1461–1470	22	29	20	26	2	3	1	1	**77**
1471–1480	61	50	48	39	10	8	3	2	**123**
1481–1490	39	46	32	38	6	7	0	0	**84**
1491–1500	26	49	19	36	5	9	1	2	**53**
Total	**173**	**33**	**138**	**26**	**28**	**5**	**7**	**1**	**526**

Chapter 7: Line management and its impact on the copying pace and the comfort of reading

Unrevised version

Line management is an aspect of manuscript production that is related to the dynamic component of the book copying. It allows us, as it were, to observe the scribe in the act of writing, and more than any other aspect does, it affords proximity to the reality of scribal production. When we examine most aspects of a manuscript, both material and textual, we are examining a finished, static product, and can only surmise on the basis of our investigations the manner by which it came into existence. However, observing the many means that copyists implemented at the end of lines to achieve to the greatest extent possible a uniform length of the copied lines reveals to us a flexible and dynamic procedure, which requires the scribe to make immediate choices between alternatives available to him line by line, in the very act of copying. Indeed, ends of lines preserve the traces of such alternating choices and allow us to reconstruct to some extent the dynamics of copying.

The ruling of the left margin marks the boundary of the horizontal lines, but it cannot guarantee that the written lines will in fact terminate at this margin. Most medieval Hebrew copyists strove to produce lines that were as uniform as possible: here avoiding protrusions beyond the line, and there filling the empty space at the ends of lines, and positioning protruding words in a manner that would not obscure the marginal boundary line. To overcome the obstacles that the artificial segmentation of the textual continuum and the fluency of writing present to the lines, Hebrew copyists developed a wide variety of solutions, some of which are shared by different geo-cultural zones, and some of them unique to or characteristic of a single zone. 'Line management', a term of recent coinage, initially in Italy (gestione della riga[1]) – is a fitting description of the scribe's actions in attempting to justify the ends of lines and produce as even margins as possible. It is crucial that manuscript users – and especially critical editors of texts –

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[1] M. Maniaci, 'Alla fine della riga: Divisione delle parole e continuità del testo nel manoscritto bizantino', *Scriptorium*, 51 (1997), p. 192. The term was later adopted by Ezio Ornato into French (*gestion de la ligne*) in the concluding essay of the collection, Ornato et ses collègues, *Face cachée*, pp. 662, 668.

recognize these justification devices, for ignorance of them can lead to misunderstandings and an inaccurate transcription of the text at the end of lines.

The development of these devices and their implementation present an exceptional richness and complexity in comparison with the limited devices employed by copyists in the Latin,[2] Greek,[3] and Arabic[4] scripts, and of course, compared to the unevenness of the line widths in many Latin manuscripts.[5] The devices employed by the Greek and Latin copyists almost always involved bisecting the word that would have exceeded the line (in Greek and Latin manuscripts) or abbreviating it (in Latin manuscripts) – simple and convenient ergonometric devices that did not impede the fluency of copying but may have hindered fluency of reading,[6] whereas the devices used in Hebrew scripts

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[2] However, see below on Latin copyists' limited use of the graphic filler device, which was so ubiquitous in Hebrew manuscripts, perhaps under the influence of the Jewish customs. Nevertheless the Insular Latin manuscripts (i.e. those written on the British Isles) present a much more complex and varied use of devices, similar to the practices of the later Jewish copyists. See e.g., the sophisticated artistic manipulations at the ends of the lines in the famous manuscripts knows as *The Book of Kells*, written ca. 800, in which one finds among other devices a lateral tilting of the letters m and n, the writing of superscript and subscript letters, and decorative fillers, see F. Henry, *The Book of Kells: Reproductions from the Manuscript in Trinity College, Dublin*, *with a Study of the Manuscript*, New York 1974, pp. 154–158 and the reproductions. See also J. Brown, 'Northumbria and the Book of Kells', *Anglo-Saxon England*, 1 (1972), pp. 219–246 [= Brown, *A Palaeographer's View*, pp. 97-120].

[3] An entire monograph has been dedicated to line management in the Byzantine manuscripts: M. Maniaci, *Costruzione e gestione della pagina nel manoscritto bizantino*, Cassino 2002. Maniaci examined 700 Byzantine manuscripts from the ninth to the fourteenth centuries, in comparison to Latin manuscripts. Her findings focus on the division of the word — the standard device used by the Greek copyists, but she also briefly mentions devices whose use was negligible, such as abbreviations or the lack thereof, dilation or constriction of letters, spacing, and superscripted letters.

[4] Indeed the Arabic manuscripts use few devices to maintain uniformity of the lines' width, and still such use is more patently visible than it is in the Hebrew manuscripts because of the nature of Arabic writing and calligraphy which permit considerable flexibility in broadening or reducing letters that have a base. In a treatise on the art of writing by a Baghdadi author who died in the early eleventh century, an Arab calligrapher is cited as saying that the most crucial skill needed for beautiful writing is the ability to justify the margins (see the translation by Franz Rosenthal in his book, F. Rosenthal, *Four Essays on Art and Literature in Islam*, Leiden 1971, p. 31. On the three methods employed in Arabic scripts to achieve lines alignment, see Gacek, *Vademecum*, p. 146.

[5] It is instructive to observe the considerable lack of uniformity in the line widths of the splendid manuscript of the Gospels of Henry the Lion, Duke of Saxony and Bavaria, a manuscript considered to be a masterpiece of eleventh century Romanesque bookmaking art, as meticulously measured by Frank Bischoff. See: F.M. Bischoff, 'Le rythme du scribe: Analyse sérielle de la densité de l'écriture dans les évangiles d'Henri le Lion', *Histoire et Mesure*, 11 (1996), pp. 53–91.

[6] Other than the monograph by Marilena Maniaci on line management in Byzantine manuscripts in comparison with Latin manuscripts (above, note 3) and a few articles appearing in the collection Ornato et ses collègues, *Face cachée*, which deal with the dismembering of words and abbreviations, it is necessary to gather fragmented information about line management in Latin manuscripts that is presented in a few studies. See also M. Beit-Arié & N. Pasternak, 'Comfort of Reading, Comfort of Writing: Some Reflections on Line Management', *Gazette du livre médiéval*, 31 (automne 1997), pp. 9–21

were many, diverse, and alternating and required alertness and constant choice-making. The efforts that Hebrew copyists invested tin inventing more sophisticated devices in order to subordinate the writing at the ends of line to the boundary margin, certainly stemmed from aesthetic considerations and conventions related to book design, but its roots are perhaps to be found in the halakhic prohibition against exceeding the line too much in the writing of liturgical Tora scrolls, as detailed in the following *baraita* from the Babylonian Talmud: 'If [when almost at the end of a line] he has to write a word of five letters he must not write two letters in the column and three outside, but three in the column and two outside. If [when he has come to the end of the line] he has to write a word of two letters, he may not insert it between the columns but must write the word at the beginning of the next line.' (B. Menaḥot 30a-30b).[7] At any rate, rudimentary forms of several devices for achieving horizontal lines of as uniform a length as possible can already be observed in the Dead Sea Scrolls,[8] providing evidence that the roots of this unique phenomenon lie deep in the past.

The devices may be classified by their purpose from the graphic point of view, as noted above; i.e., they were designed to prevent the written line from exceeding the margins, to prevent empty spaces at the end of lines and to blur the effect of protrusions beyond the boundary margin line. However, there is another aspect to the means of lines alignment employed by the copyists, which may furnish a criterion for their classifying, namely, their effect on the fluency of writing and comfort of reading. Each choice of a device had a different impact on the scribal inputs into the production of the book, including the time spent on copying, the levels of attention and planning while copying, and also the amount of writing material used – all of which are economic values that ultimately affected the cost of the book. From the reader's point of view, the choice of one device or another affected the legibility of the text and the fluency of reading. Examining the variety of solutions for aligning the lines according to the above criteria suggests they should be classified into two groups: solutions that do not interfere with the integrity of the last word in the line, and solutions that do not avoid bisecting it.

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[7] In the divergent approaches of the early *poskim* (halakhic decisors) in regard to the degree of deviation from the borders of the column, see Glatzer, 'Aleppo', p. 215, note 1.

[8] See Beit-Arié, *Hebrew Codicology*, p. 88, note 164; p. 89, note165; p. 103, notes 168, 170; and to those notes further examples have been added: Tov, *Scribal Practices*, pp. 106-108 [and earlier, E. Tov, 'Scribal Practices and Physical Aspects of the Dead Sea Scrolls', in Sharpe III & Van Kampen (eds.), *Bible as Book*, pp. 21-23].

It should be noted that the choice of this or that device from among the variety available to the scribe was a personal one. Therefore, when examining the rates of use of one of the means for lines alignment, one must take into account that approximately one tenth of dated manuscripts were copied by several scribes. Therefore, the manuscript corpus we use to describe the distribution of the various devices and compare among them is that of all the dated manuscripts until 1500, and the rates are calculated on the basis of the total number of manuscripts including their scribes, i.e. the number of records representing codicological units. See in greater detail above, in the Introduction, under the section titled 'General statistics of the database' (preceding Table 5).

a. Lines alignment which does not interfere with the integrity of last words

This group comprises the following means:

(1) Dilating or constricting the last letters or reducing the size of letters liable to exceed the margin

Dilation was only used for letters that could be extended without distorting their shape or causing them to resemble different letters,[9] and therefore when such letters did not occur at the end of a line, the penultimate letters were sometimes dilated. Dilation was executed in two ways: the entire letter was written in dilated form (sometimes the scribe wrote a larger letter), or the scribe would write a standard size letter and only later extend it to the margin boundary line.[10] This was the basic, most convenient and most flexible means that was used in almost all

Dilated and constricted letters in an Ashkenazic maḥzor, 1345. MS Vatican, Vat. ebr. 438, fol. 107v

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[9] For this reason letters such as *vav* or medial (non-final) *nun* are not dilated (sometimes only the base of the *nun* was widened).

[10] The first to observe this common practice was Nurit Pasternak.

medieval manuscripts, but was especially convenient and suited to the square script.[11]

The fact that this means is avoided by scribes only in less than one percent of all manuscript records in the above corpus suggests that this device may be inherent to the very use of the Hebrew script.[12] Examples of this simple device can be seen in the above image and in most of the images incorporated below.

A secondary stratagem of constricting letters at the end of a line is minimising the size of the letters that are at risk of exceeding the margin, or writing the final letters of a line in a cursive or fluent script that shrinks their width to avoid exceeding the margin.

(2) Inserting graphic fillers

The insertion of graphic fillers in the empty space remaining at the end of a line is a very ancient stratagem in both the Occident and Orient. Seventy percent of the manuscript records evidence its use (81 percent in the Ashkenazic zone, versus 55 percent in the Orient). The graphic fillers are variously designed. Sometimes, especially

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[11] On the dilation of letters in Jewish gravestones from medieval France see C. Sirat, 'Ecriture sur pierre et écriture sur parchemin – Les Juifs de Paris au XIII siècle', *La Revue du Louvre et des Musées de France*, 33.4 (1983), pp. 250–251. For the influence of Arabic calligraphy on the Hebrew practice see Sirat, *Papyrus*, pp. 72, 75.

[12] Letter dilation has not however been observed in the Judean Desert scrolls, but rather the opposite stratagem – the reduction of letters – has been discerned in them (see Tov, *Scribal Practices*, pp. 106-108). This stratagem eventually entered the halakhic laws guiding the writing of Tora scrolls. The adoption of the practice of letter dilation at the end of the column is first documented, to the best of my knowledge, by Menaḥem ben Shelomo HaMe'iri (Provence, 1249-1316), in his book *Qiryat Sefer*, M. Hershler edition, Jerusalem 1956, p. 62. Commenting on the *baraita* in Tractate Menaḥot he writes: ואם אינו יכול בפנימיות השטה אלא שתים והוא צריך להוציא ג׳ <אותיות> בחוצה לה, לא יעשה כן אלא מניח המקום פנוי או מאריך באותיות שלפני תיבה זו עד שיגיעו לסוף השטה. His opinion on the matter apparently contradicted that of the *Rishonim* and even of the later halakhic decisors. Maimonides ruled that the space should be left empty and the writing continued on the next line (מניח המקום פנוי ומתחיל מתחילת השיטה (*Mishne Tora,* Sefer Ahava, Hilkhot Tefillin u-Mezuza ve-Sefer Tora 7:10). The author of *Hagahot Maimoniot*, Meir HaCohen, a disciple of Rabbi Meir of Rothenburg, explicitly adds at this point that it is forbidden to draw out the letters to extend to the end of the line: אבל למשוך האותיות ולעשותן גדולות עד סוף השיטה אסור. A similarly worded prohibition is still included in the *Shulḥan 'Arukh*, Yore De'ah, Hilkhot Sefer Tora, section 273: ואם אין מקום כדי לכתוב ג׳ <אותיות> בתוך הדף, יניח המקום חלק ולא ימשוך האותיות לעשותן גדולות מחברתן כדי למלאות עד סוף הדף. Even later halakhic sources dedicated to the laws of writing ritual scrolls, in which one can find evidence of the practice of dilating letters, these examples are reported with some hesitancy. The letters mentioned in these texts are usually those that had been dilated by copyists of codices (e.g. the letters *alef, he, lamed, tav,* and *mem*). See e.g. the words of Yona Landsofer in his book *Benei Yona*, Prague 1801/2, fol. 3r: ועיקר שמרחיבין הם אלף, ד, ה, ל, ק, ר, ת ולפעמים מ״ם סתומ׳ <...> ואם דבריהם קבלה – נקבל. Cf. the statement of Dov Bamberger, *Melekhet Shamayim*, Altona 1852/53, rule 11 (fol. 43r) on the tradition of dilating the letters *lamed, resh, dalet, tav,* and *he,* and his reservation that it is preferable not to dilate any letter: וטוב מאד שלא יצטרך להאריך שום אות פן תשתנה מצורתה דאז פסולה מדאורייית.

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in early manuscripts from the Middle East and in Sefardic manuscripts, the filler is simply a complete letter, and especially stunted letters (mostly *alef* and *shin*).

Line fillers. <Palestine>, 929. MS St. Petersburg Евр. II B 17, fol. 154v
Written by the scribe of Aleppo Codex of the Bible

Although some graphic fillers bear an individual stamp, the scribe employed a stock of basic shapes that conformed to regional types. It is quite possible that the rudiments of this practice can be seen in some of the Judean desert scrolls and in documents found there.[13]

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[13] *Alef* was written at the end of the line in the *Pesher Habakkuk* scroll (see the coloured facsimile in the photographic edition of three scrolls from Qumran, *Scrolls from Qumrân Cave I*, Photographs by J.C. Trever, Jerusalem 1972, nowadays on the website: http://dss.collections.imj.org.il/he/habakkuk). At the ends of twelve lines from this same scroll there are visible ✕-shaped graphic fillers (e.g. Plate LVI, where the graphic mark appears four times). Such ✕ marks sometimes also occur in the intercolumnar margins of the first Isaiah scroll, and the meaning of their appearance has been debated by scholars. See M. Martin, *The Scribal Character of the Dead Sea Scrolls,* vol. 1, Louvain 1958, pp. 175–179, 199–200. ✕-shaped fillers are also visible in the documents written by the Bar Kochba administration in Ein Gedi and found in Naḥal (Wadi) Ḥever. See Y. Yadin, *Bar Kokhba: The Rediscovery of the Legendary Hero of the Second Jewish Revolt against Rome,* London 1971, pp. 177, 179 (both documents were written by the same hand). Yadin (ibid. p. 173) estimated that the scribe inserted this marking in the spaces at the end of the line in order to prevent forgeries of the legal document. Tov (*Scribal Practices*, p. 108) draws particular attention to the papyri from Naḥal Ḥever. Cf. The various markings appearing at the end of the lines in the scroll fragment 4QCant[b] (E. Ulrich et al. [eds.], *Qumran Cave 4.XI: Psalms to Chronicles* [*Discoveries in the Judean Desert* (below *DJD*) XVI], Oxford 2000, esp. p. 210 & pp. 213, 217, pl. XXV) and the comment by Tov, the editor of this scroll, who comments on their unclear function.

(3) Filling up the line by the first letter of the first word of the next line

Under the graphic filler device one can also subsume the practice of filling up the end of the line with only a single letter – the first letter of the first fully written word in the next line. Ostensibly this is one of the most frequent stratagems of the second group of solutions, namely, the anticipation of the first letters of the first fully written word in the next line. In respect to the entirety of manuscript records in the abovementioned corpus in which this widespread stratagem appears, the version that limits its application to one letter is evidenced in 15 percent of the total number (see in further detail below in regard to Stratagem 1 in the second group). However, the limitation to one letter only makes this sub-stratagem more akin to that of the graphic filler, since

More recently, Hanan Eshel presented Hartmut Stegemann's suggestion regarding the function of these ✕ marks in *Pesher Habakkuk*, a suggestion that has importance for the history of the scroll's text version and its transmission. See H. Eshel, 'The Two Historical Layers of Pesher Habakkuk', *Zion* 71 (2006), pp. 143-152 (in Hebrew). Stegemann cleverly suggested that the 'orphaned' *alef* at the end of line 5 in the second column (like the *alef* at the end of the last word in the following line, whose meaning has been debated by scholars) is simply an erroneous copying of an ✕-marking that the scroll's main scribe saw in the *Vorlage* of the text, which was the source for his copying and whose layout he imitated scrupulously (as Eshel notes). As he continued his copying the scribe noticed this marking again and no longer confused it for the letter *alef*, and so we find ✕-markings at the ends of the lines in columns 3, 4, 6, 8, 9, 10, 12. Stegemann did not suppose that these markings were used as graphic fillers for the ends of empty lines in the *Vorlage*, but proposed rather that they had been used to guide the ruling of the vertical margin. This explanation remains questionable. Indeed, most of the columns in *Pesher Habakkuk* contain a pair of ✕-markings, as would be expected if their purpose was to guide the ruling of a line, and the lack of such markings in columns 1, 5, and 11, could merely be due to the scribe's having ignored them (as Eshel supposed, ibid., p.145, note 11), and the same could be argued in regard to the two columns (8, 12) where only a single ✕-marking appears. However, this shrewd hypothesis needs to be questioned on several accounts: first – why was this technique used only to rule the vertical boundary margin to the left of the lines and not the one to their right? Moreover, a few of these pairs of markings are extremely close together (as in line 12 and in line 14 in columns 3-4), the markings are placed within the written area and not, as one would expect, in the upper and lower margins of the scroll, and their positioning also lacks uniformity – these considerations together give cause to doubt Stegemann's suggestion. This explanation, furthermore, fails to account for most of the instances of this marking in the Isaiah scroll, in which only a single marking appears per column (except for Plate XXXIV in Trever's photographic edition, mentioned above, and currently in http://dss.collections.imj.org.il/he/isaiah column 34, lines 10, 15), and what's more, these markings are written between columns and do not overlap with the vertical margin lines.

At the end of a number of lines in the Isaiah scroll one can observe graphic filler in the form of two supralinear thick dots. See http://dss.collections.imj.org.il/he/isaiah,verses 3:4, 4:4, 25:11 29:7, 32:3, 32:18. Was the letter *he* also used as filler in this location (48:13)? Glatzer ('Aleppo', pp. 257-258) notes that prior to the eleventh century one does not find full letters filling the line, this feature being one of the reasons to doubt the dating of MS Cairo, ostensibly written in 894/5 (see above, chapter 1, section 3); however, it should be noted that the seven surviving pages of a manuscript written in 942/3 do reveal graphic fillers shaped as the letter *mem* (see *Codices hebraicis*, I, Manuscrit 7).

both scribe and reader were certainly aware of the mere graphic function (i.e. devoid of linguistic meaning) of a single letter in Hebrew or Judaeo-Arabic.

(4) Increasing spacing

Achieving lines alignment by flexibly adjusting the space between words, the only means used in mechanical printing, was sometimes employed in manuscripts, but only by leaving extra space toward the end of the line: before the last word or the last letter, or before the graphic filler, or the beginning of the next word. Increasing the distance among letters or between words was an especially common practice in Spain.

(5) Writing the words liable to exceed the margin slantwise

The stratagem of writing the word at the end of the line slantwise was initially meant to prevent the word from exceeding beyond the boundary margin line. However, in practice, in most cases this stratagem only reduced the degree of protrusion, while still preserving the appearance of the margin boundary line. This stratagem was widespread in the non-biblical manuscripts produced in the Middle East,[14] undoubtedly inspired by Arabic manuscripts, and was employed in half of

Words liable to exceed the margin written slantwise. Qaryat Thila (Yemen), 1433. MS Jerusalem Yah. Ms. Heb., fol. 71v

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[14] The earliest manuscript in which the scribe employs this device was written in Cairo in 1023. See *Codices hebraicis*, II, Manuscrit 22.

all manuscript records produced there (in the fifteenth century it was used in 74 percent of them; its frequency in Yemen during the same century was 68 percent, and in the fourteenth century it was 91 percent) and in Byzantium, in which it is found in 32 percent of the records. It seems that in Yemen the stratagem evolved from a line management technique to a fashionable aesthetic choice, as clearly illustrated in the example given above, in which most of the last words on the page are slanted.

Solutions of non-interference with the integrity of the last word demand from the scribe a certain degree of alertness, foresight in regard to the copying process, and even a quick calculation of the number of missing words required to complete the line, or an instinctive assessment of the space available to fill it. Before reaching the left margin line the scribe would have to estimate the space left compared to the length of the next word and make an ad hoc decision whether to continue the fluent, regular copying or employ one of the above-listed stratagems, and if so, decide which one to use. These solutions that avoid dismembering the last word undoubtedly contribute to the comfort of reading. They do not hinder the fluency of reading because they are not inherently likely to mislead or confuse the reader, while they are still able to achieve an aesthetic presentation of the written space. But it seems that the use of the stratagems in this group increases the input of copyists in energy, concentration, alertness and calculation, and thus slows down the copying pace and increases production costs. The greater the scribal input into line management, the greater the legibility of the text. The use of these devices therefore reflects a preference of reading fluency over economising in production costs. The economic interest and the interests of legibility are hence mutually contradictory and unbalanced.[15] However, we should review the practices of the second type and their frequency, and particularly the proportions of devices of both types employed by the same scribes, before passing any judgement on the balance of interests in line management.

b. Lines alignment by breaking up last words

This group includes means of justification that involve dismembering the last word, either by actually or seemingly bisecting it or bisecting the word's sequence.

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[15] Contrary to Ezio Ornato's energetic balance theory. See Ornato, 'Exigences fonctionnelles', pp. 10-12 [=Ornato et ses collègues, *Face cachée*, pp. 12-124].

(1) Filling up the line by anticipating part of the word at the beginning of the next line[16]

The copyist fills the space left at the end of the line by writing as many letters of the last word as the boundary margin allows and then re-writing the complete word at the beginning of the following line.[17]

In the fragment shown here, excerpted from a German manuscript from 1232/3 (MS Munich, Cod. Hebr. 5), this stratagem is used at the end of the first, third, sixth, and eighth lines. On the page from which this example was taken the copyist employed this stratagem thirty three times within the space of three columns!
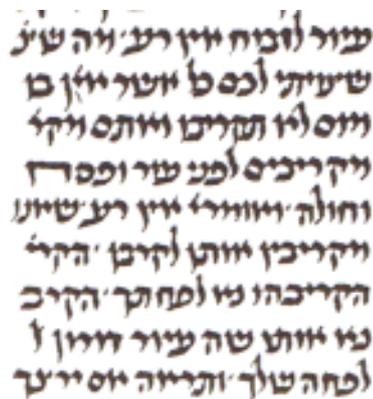
In half of the records of manuscripts that employ this stratagem one can discern a tendency to write the last letter in a stunted shape by omitting one of its strokes. It was especially common to stunt the letters *alef*, *mem* (in its initial/medial form), and *shin*.

This time- and space-consuming device, which increases the copying volume as well as the amount of writing material, was common in all zones from the times of the earliest dated manuscripts. It was employed in two-thirds of all the extant manuscript

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[16] The origins of this device can already be found in the ancient period, in the Judean desert scrolls and documents: once in the Beit Mashku letter from the Bar Kochba period (See P. Benoit, J.T. Milik & R. de Vaux, *Les grottes de Murabba'at* (*DJD* II)*,* Oxford 1961, pl. XLV (no. 42). Nurit Pasternak has drawn attention to incidents of this device being used in the Isaiah scroll (now at http://dss.collections.imj.org.il/he/isaiah) וה – והוכיח (col. 2, line 11), מ – מזמרות (col. 2, line 12), או – אוריה (col. 7, line 19), באש – באשפתיו (col. 40, line 3 from the bottom), ומס – ומסלתי (col. 41, line 10), and ותקשרים - <?>ו (col. 41, line 17), and apparently also in fragment 11 of the Damascus Covenant scroll 4Q266, line 16 (יו – יושבי). See J.A. Baumgarten & J. Milik with contribution by S. Pfann & A. Yardeni, *Qumran Cave 4.XIII: The Damascus Document (4Q266–273)* (*DJD* XVIII), Oxford 1996. Cf. two examples given by Tov (*Scribal Practices*, pp. 107-108), but these do not belong to this type of device because the continuations of the word beginnings are written sublinearly. This devise was employed already in the Aleppo Codex, and Glatzer counted 53 occurrences of it ('Aleppo', pp. 218-220

[17] This device was also used on gravestones in France (see Sirat, 'Ecriture sur pierre' [above, note 11]). The apparent use of this stratagem in the writing of Tora scrolls is suggested by the unusual comment attributed to El'azar of Worms, as cited by Bezalel Ashkenazi in his book *Shita mequbetset*. This commentary to the end of the *baraita* from Tractate Menaḥot – cited earlier at the beginning of this chapter (near the text referencing note 7) refers to the use of the phrase חוזר וכותב (lit. ="goes back and rewrites): מאי חוזר וכותב. לא היה ליה למימר חוזר כיון שלא התחיל בסוף מהשיטה, ופי' הרב ר' אלעזר מגרמייזא כגון שנזדמנה לו תיבה של ה' אותיות כגון "אברהם" והוא כתב "אבר" וניתותר "הם", אף על-פי שאמרנו שתי אותיות כותב לחוץ, הכא כיון שהם תיבה אחת בפני עצמה לא יזרקנה אלא חוזר וכותב בראש השיטה. A similar version appears in the handwritten annotations to B. Menaḥot, Venice 1521/2, which are attributed to Bezalel Ashkenazi (See Beit-Arié, 'Worms', p. 22, note 136).

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records (in 15 percent of them only the first letter was anticipated, as described above for device no. 3 in the first group), but of course, its distribution was not uniform over time and space. In France and in the German zones, for example, the device was used in 86 percent of manuscript records (in the thirteenth and fourteenth centuries it was used in 91 percent of them), whereas in the Orient it is used in only 36 percent (except Yemen, where it appears in half the records).

The page shown in the figure below, from a manuscript written in Paris in 1303, illustrates the copious usage of this 'wasteful' device in France and Germany. Three of its columns contain thirty two instances of anticipated letters, many of which are followed by graphic filler (a stunted *alef* at the end of the second line of the first column, marked with an arrow).

Formally this device can indeed by classified with the second group; however the bisecting of the last word is artificial since the integrity of the word is restored in the next line. Therefore, in principle, there is good reason to classify this device with the first group. But from the

Anticipating letters. Paris, 1303
MS Paris hébreu 44, fol. 131v

viewpoint of reading ease it is obvious that such a device may hinder the fluency of reading and mislead the reader, who may interpret the cluster of letters used merely as a justification device as an actual word, especially if a meaning could be construed for it. The custom of marking the last letter of such anticipating letters with a kind of apostrophe, meant to indicate that the letter is cancelled or should be ignored, could not save the reader from confusion, since the mark is identical to the one used to indicate

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abbreviation, and the letters could be construed as an abbreviated word. Nevertheless, because it is possible to classify this device both with the group of dismembering devices and with the group of devices that preserve the word's integrity and continuity, both possibilities should be subjected to statistical evaluation in order to draw conclusions about the preferences of copyists and owners in regard to the trade-off between ease of reading and the fluency of copying and its costs.

(2) Writing the exceeding letters between the lines

Exceeding letters are written above the end of the word segment written within the margin line.[18] Naturally, the part of the word written between the lines tended to be written in smaller letters. Whereas copyists made an effort to write the exceeding part of the word between the lines without exceeding the margin, many did not avoid protrusions, as in the example below. In the case of this device, it appears that the bisection of the word does not in itself prevent the letters from exceeding the margin, but because these letters are shifted away from the linear sequence of the line, the visible effect of the margin line remains conspicuous.

This device is found in a third of all manuscript records (only in 15 percent of them during the thirteenth century, in 40 percent during the fifteenth century, in the zones of Sefardic book culture and in Byzantium in 59 percent of them, in Italy in 29 percent, in the Orient in one quarter of them, and in only 6 percent of them in Yemen, and only a few records in Ashkenaz). In a quarter of the manuscript records in which this device was used, the practice was confined to one letter only.

Although this method does not completely separate the two segments of the word, the word is not written on the line's extension in a linear manner, and visually speaking it is split in two.

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[18] This device also has ancient roots in the practices of some of the scribes of the Judean desert scrolls. The scribe of the *Serekh hayaḥad* (=The Community Rule) scroll employs it twice (see M. Burrows (ed.), *The Dead-Sea Scrolls of St. Mark's Monastery*, vol. 2, New Haven 1951, pl. V, ll. 15, 24, now at http://dss.collections.imj.org.il/he/community col. 5, lines 15, 4); however this scribe also suspended the final letter of many words within the line too. Nevertheless, it seems that the practice of writing exceeding letters between the lines was popular among the Qumran copyists. Nurit Pasternak has drawn my attention to a number of examples from the Isaiah scroll: 3:9 (הגיד/ו), 3:14 (בבתי/כם), 3:18 (העכיסי/ם), 33:6 (הדברי/ם), 33:4 (ונשאת/ה), 54:11 (ויסודו/תיך), and these can easily be seen today on the website at http://dss.collections.imj.org.il/he/isaiah. Additional instances of this phenomenon can be seen in the *Pesher Habakkuk* scroll, e.g. in Plates VIII, X, XII in Trever's photographic edition (above, note 13), and currently at http://dss.collections.imj.org.il/he/habakkuk in cols. 8, 10, 12, which parallel the aforementioned plates. The suspension of a single letter at the end of lines appears in the Damascus Covenant scroll 4Q226 (above, note 16), fragment 11, line 13, etc. and also in other fragments.

MS Zurich, Jeselsohn collection 11, p. 102. A maḥzor written by Leon ben Yehoshuʻa of Cesena, who copied five manuscripts, all of them ornamented and decorated, between 1462 and 1468 in the region of Emilia-Romagna in northern Italy. The first part of the maḥzor is MS Jerusalem Heb. 8º 4450

(3) Writing exceeding letters vertically along the margin line

As the scribe reached the left margin line, he continued to write part of the exceeding word along the margin line, usually in an upward direction. Sometimes even entire words were written this way.[19] This device also does not prevent letters from exceeding the margin line, but it preserves its visual effect.

The use of this device was limited, and can be found only in 9 percent of the manuscript records (especially in Ashkenaz, were it is used in 15% of them), often at the end of chapters or passages.[20]

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[19] In one instance, the scribe of the *Serekh hayaḥad* scroll completed a word in this manner by writing two exceeding letters vertically in a downward direction (see the scroll's edition [above, note 18] Plate III, line 22, and now at http://dss.collections.imj.org.il/he/community col. 3, line 22). In the Isaiah scroll, as it appears in http://dss.collections.imj.org.il/he/isaiah, exceeding letters were not written in this fashion, and therefore this late practice of medieval scribes should not be associated with the full verses in the scroll that were omitted and later added by a second hand in vertical, downward fashion.

[20] In MS Vatican, Vat. Ebr. 165, which was apparently copied in fourteenth century in France and most of which contains the *Sefer Mitsvot Qatan* written in two columns, the copyist frequently employed this

Exceeding letters written vertically. <Germany>, 1257/8, MS Oxford Mich. 617, fol. 11r

(4) Writing exceeding letters at a distance in the margin

With this device both segments of the word bisected at the margin keep to the linear formation of the line, but a considerable space is left between them. A reader might fail to detect the completion of the word inside the margin. Although the copyist places the ends of the last words in the line beyond the margin line, this distancing actually accentuates its visual effect.[21]

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device at the end of the first column as well. However, because the intercolumnar space was too narrow to accommodate vertically written words, he inscribed them vertically, not from the end of the line upwards but rather at the beginning of that line, downwards!

[21] In MS Parma, Parm. 204 (Italy 1461), rhombus-shaped dot markings were used to bridge the beginning of the word at the end of the line with the end of the word placed at a distance in the margins. MS Parma, Parm. 1756 (Italy, the second half of the fifteenth century) contains many abbreviated words, but toward

This device is employed in l5 percent of manuscript records. Its diffusion is particularly noticeable in France and the German lands where its rate is 37%. As with other devices, its prevalence increased over time (17 percent in the thirteenth century, 50 percent in the fifteenth century). Compared to Ashkenaz, the use of this method in the Orient and in Yemen is negligible.


Exceeding letters at a distance in the margin, and calligraphic graphic fillers
MS Munich Cod. hebr. 200 fol. 7v * <Austria or Bavaria, ca. 1480>

the end of the copying the scribe began sometimes to write the remainder of the word at a distance in the margin, marked by hyphens bridging the space between the two parts of the word. Completion of words at a distance in the margin is evidenced in an Arabic Manuscript, MS Jerusalem, Yah. Ms Ar. 362, which was written in 1208, apparently, in Persia.

(5) Lexitomy – splitting the word at the end of the line over two consecutive lines

The word is bisected by writing part of it at the end of the line and completing it at the head of the following line. In many manuscripts in which word bisection is used the segmented part at the end of the line is followed by a graphic mark, usually a slant, in order to indicate a bisection. In a few manuscripts in which this device is employed the beginning of the following line in which the bisected word is completed was similarly marked. This is the most convenient device in terms of fluency of copying and it was the main means of line justification used in Latin[22] and Greek[23]
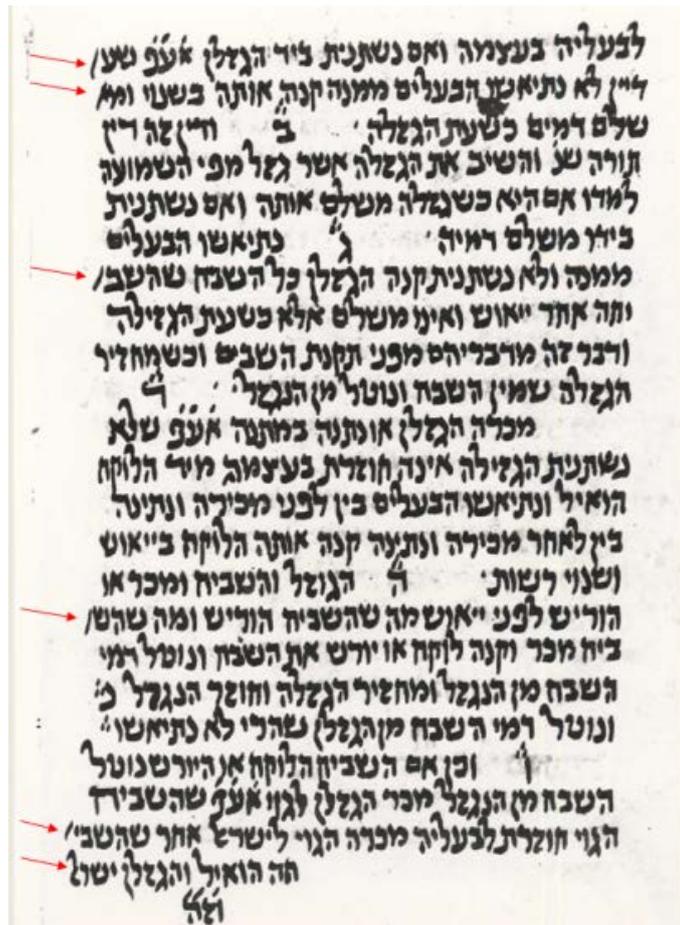
<Yemen>, 1486 *
MS Jerusalem, Mosad Harav Kook 302, fol. 130v

manuscripts. However, surprisingly, it was used only in a small number of dated Hebrew manuscripts and almost never was used in Biblical and liturgical manuscripts.[24] The practice of bisecting words at the end of the line in this manner began in Italy,[25]

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[22] The main stratagem for bisecting a word in the Latin manuscripts was not commonly used, apparently, before the Gothic period, based on a study of the plates of the manuscripts and their transliterations that are appended to Parkes' book, *Pause and Effect*. While the earliest example of word bisection that he presents is from as early as 517, and is still written with no separation between the words (Plate 4, p. 66, transliteration on p.167), there are few occurrences of this practice before the spread of the Gothic script, especially in the thirteenth and fourteenth centuries.

[23] See Maniaci's book, *Gestione della pagina*.

[24] For an Arabic scribe's recommendation to avoid bisecting words, see Rosenthal (above, note 4), pp. 43-44.

[25] Tov (*Scribal Practices*, p. 108) mentions the phenomenon of word bisection applied mostly at the ends of lines in the Leviticus scroll written in the Paleo-Hebrew script (See D.N. Freedman & K.A. Mathews, *The Paleo-Hebrew Leviticus Scroll (11QpaleoLev)*, Philadelphia 1985, p. 9) as well as in the included plates and transliterations.

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and appears already in the earliest extant Italian Hebrew manuscript from 1072/3. In Byzantium and (to a limited extent) in Ashkenaz, this device was in use from the end of the thirteenth century, in the Orient it is first found in the fourteenth century, but only in a small number of manuscripts,[26] whereas in Yemen it proliferated during the fourteenth and fifteenth centuries. The sum total of manuscripts in which this device is used should not include Judaeo-Arabic manuscripts from Muslim lands in the Orient and in Spain, in which only the definite article אל- was separated from the noun it preceded, since the separation of the definite article in the middle of the line is also very common in Judaeo-Arabic manuscripts, and therefore this custom should not be counted among line alignment devices.[27] Taking into account this caveat in regard to the scope of this device's application, its overall rate is only 9 percent: in a third of the records of Yemenite manuscripts; in 13 percent of records of manuscripts from Italy; in 9 percent of records of manuscripts from Byzantium; in 5 percent of records of Ashkenazic manuscripts; and in a miniscule rate in the records of Oriental (Yemen excluded) and Sefardic manuscripts.

In half of the records of Italian manuscripts in which this device is employed only proclitic morphemes (such as the definite article or various prepositions and combinations thereof) were separated, and this separated part of the word was conspicuously marked in most of these manuscripts by vocalisation signs. This rigid grammatical basis for this bisection, emphasized by the distinctive use of vocalisation marks, leads us to doubt whether such a variant should be classified within the dismembering solutions.
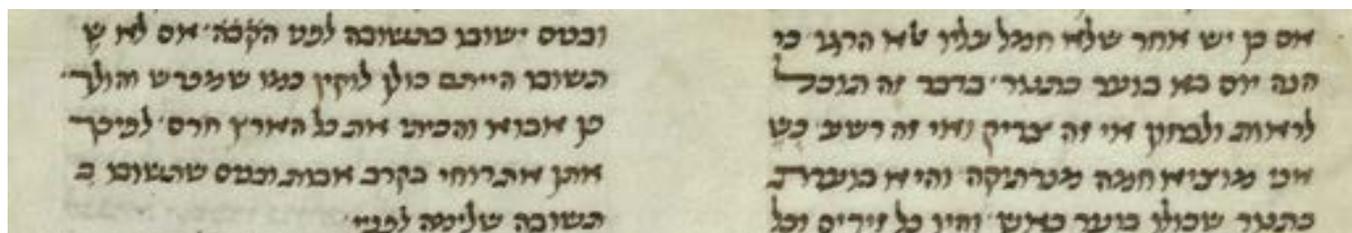
A manuscript written by Paula bat Avraham in Rome in 1288
(See at the beginning of n. 11 in above, chapter 2)

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[26] Word bisection appears in an early Oriental *piyyut* fragment (MS Vienna, ÖNB Erzherzog Rainer Collection H110). See E. Fleischer, 'New *Shiv'atot* on the Priestly Courses of the Payyetan R. Pinḥas', *Sinai*, 61 (1967), p. 36 (in Hebrew).

[27] Cf. J. Blau, *A Grammar of Medieval Judaeo-Arabic*, Jerusalem 1961, p. 54, section 45 (in Hebrew). Examples of bisection occurring at the end of the line are cited in note 5, ibid.

If we ignore Italian-style grammatical bisections, which can only be executed in a limited number of cases, we find that the bisection of words at a random location for the sake of preserving the margin line appears in only 5 percent of the Italian manuscript records in the aforementioned corpus. And if we take the tally of manuscript records that is limited, as detailed above, only to those in which this device is clearly present, and also exclude from it those Italian manuscript records in which only prepositions were separated, we find that 5 percent is also the rate of use of this device within all the Hebrew manuscripts in this corpus. Moreover, the distinctively clear use of this device within all manuscripts is restricted only to a few lines and a small number
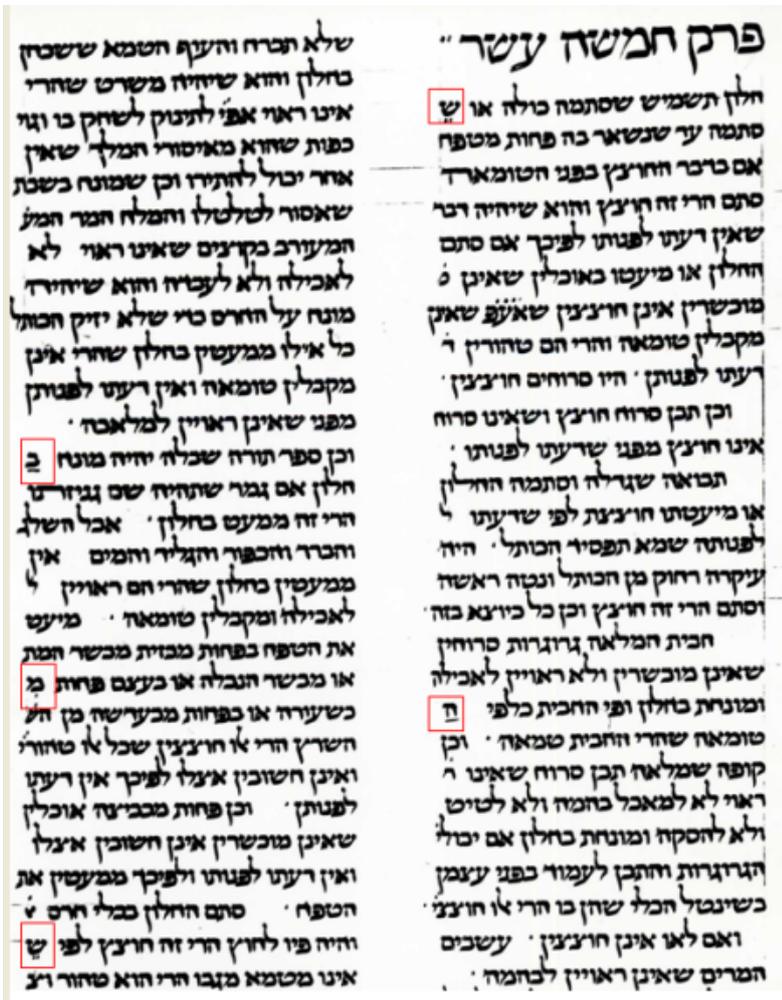
<Italy> 1314 * MS Oxford MS. Opp. Add. Fol. 31, fol. 141v

of pages. The stratagem of arbitrarily dividing the final word on the line as the scribe approached the margin line, which was so convenient in terms of copying fluency, was nonetheless mostly rejected by Hebrew copyists.

(6) Abbreviating the final word in the line

It is interesting that this intuitive device, certainly convenient and efficient from the copyist's standpoint, and economical in terms of writing inputs and writing material, had only limited use in Hebrew manuscripts. At the end of lines one usually finds only elisions of the word endings that were customarily used within the line as well, especially of pronominal morphemes, and in most cases only one or two letters were

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elided. The fact that Hebrew writing did not develop a sophisticated system of abbreviation by means of word compression, as in Latin writing, clearly shows that readability was a of higher priority than any other interest.

At first glance it appears that a line management technique that permits word dismemberment requires less effort and attention from the scribes, and allows them to increase their copying speed. The copyist is not required to stem his flow of writing until he arrives at the margin line on the left; only then does he decide, without the need for calculations or estimations, whether he will repeat the full word at the start of the next line, or write the remainder of the word between the lines – at a remove from the margin line or along it – or perhaps divide or abbreviate the word. On the other hand, these devices will inhibit reading fluency at the ends of lines, will require greater attention on part of the reader, and may sometimes mislead and interfere with comprehension of the text. Ostensibly, the equation is clear to see: fluency of copying, which involves a reduction of production costs amounts to inconvenience of reading. However, a more careful examination cannot ignore a number of contradictory aspects that are inherent to implementation of some of the devices that damage the integrity of the word, thus upsetting the validity of this negative equation. The most common device, for example the anticipation of part of the first word on the next line, while not requiring foresight and posing no obstacle to the fluency of copying, does increase the copying load and the quantity of writing material. The unusual "double-decker" interlinear writing, completions of words at a distance within the margins, and certainly those written in an upward direction along the margin line, no doubt also interfered with the regularity of copying. It seems that the copyists themselves did not profit especially from dismembering the word, unless they divided it between two lines or abbreviated it – the two most convenient justification means available to the scribes (but which only some put to use). There is no doubt, then, that most scribes who employed these devices invested less in alertness levels and planning, but the regularity of their copying suffered, and consequently, so it seems, its fluency was disturbed.

Before attempting to analyse and comprehend these data, we must check whether copyings exist in which devices of both groups are implemented together, and find out the percentage of copyings which contain devices from one group only. As it turns out, many copyists exploited and combined a number of justification device, up to six, from both groups.

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In the dated corpus the proportion of records in which the scribes avoided any bisection of the last word in the line is 50 percent. It should be noted that this percentage includes the manuscript records that contain the device of anticipating part of the word written in full on the next line, since I view this as an artificial bisectioning of the word (see above, device no. 1 in the second group), and also includes the Italian manuscript records in which only prepositions morphemes were separated at the end of the line, as well as the Judaeo-Arabic manuscript records in which only the definite article אל is separated at the ends of lines, since these should not be regarded as line management devices (see above, device no. 5 in the second group). In other words, in half of the manuscript records scribes avoided bisecting the core of the last word, unless they were to resurrect it on the following line, and similarly refrained from writing some of the letters of the final word in the interlinear space, vertically along the margin line, or at a distance from it. In the Middle East, the proportion of these manuscript records is the highest – almost three quarters, in Ashkenaz and in Italy their proportion is close to a half (52 percent), and in Byzantium and the Sefardic zones it is more than a third (see below, Table 35).

In the remaining manuscripts in each zone, copyists did not limit themselves only to devices that clearly bisected the last word, since many copyists, as was emphasized earlier, implemented devices from both groups. Almost all of them dilated and contracted the letters, and many of those who used means of dismembering words, also chose the method of increasing spacing and using graphic filler – all devices that involve some sort of calculation and a deceleration of the copying pace. These data are remarkably instructive indeed. They indicate that in half of the dated copies, ease of reading was preferred over ease of copying and reduction of inputs into book production, while the other copies mostly reflect the combined interests of the scribe and the reader.

The imbalance between the contradictory interests in line management – ostensibly grounded in considerations of readability rather than economic considerations – is evident both in the copying of professional or hired scribes, as well as in copying for

self-consumption which comprise half of all the copying.[28] This imbalance magnifies the surprising fact that, unlike his counterparts who copied in Greek and Latin scripts, the Hebrew copyist implemented a rich store of devices, and furthermore continuously changed, combined, and overlapped them. Such resourceful use of a broad palette of solutions for line management demands closer attention and ingenuity, disrupts the regularity of copying, slows its pace, and involves increased production inputs. No doubt, the wealth of devices and their frequent alteration were liable to interfere with the readability and even confuse readers.

It should be stressed that all quantitative data presented here pertain to manuscripts in which one of the above methods of lines alignment was used. Yet to be examined are the frequency of use of each device within a single codex, the ratio of the number of managed lines to the number of written lines, and even the degree to which the type of script, the manuscript quality, and the usefulness of the text and of its genre influenced the choice of device and their distribution. By way of illustration, an examination of Biblical and liturgical texts, mostly of high production quality, reveals that most of the devices were usually implemented, although the interlinear writing of exceeding letters is limited, the abbreviation or slanting of a word is considerably minimized, and the division of words over two lines is avoided completely (except for in a few cases). The restrained use of word dismembering devices in sacred texts and in liturgy, alongside the prevalent custom of writing part of a word that anticipates the fully written first word of the next line, indicate that filling the line in this manner was not considered an impediment for the reader, and more importantly, was not seen as obstructing the faultless transmission of the Scriptures. It is therefore justified to include this device among the means of lines alignment that preserve the integrity of the word, even though it was formally classified above in the dismembering category.

Notwithstanding our findings on the clear supremacy of the interest of reading in the management of Hebrew book production, we cannot escape from looking for another, extra-functional, supra-economical consideration or impulse which guided or inspired Hebrew scribes and readers in their compulsive use of a rich selection of justification practices. The catalyst seems neither to have been monetary nor related to comfort of reading, but rather aesthetic – the pursuit of lines alignment by all means. This artistic

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[28] On the rates of copyings for self-consumption in Jewish society, see above, chapter 1, section 5: The unique character of Hebrew book production, and Table 11, ibid.

principle of book design quickly blossomed into a medley of devices and fashions, many of them common to several zones, some of them developing only in certain regions. All scribes had at their disposal a stock of traditional devices practised in their area from which they would draw their individual choice. Multi-hand manuscripts reveal that there are usually visible differences in the combinations of practices among scribes working in ensemble (and conspicuously so in the forms given to the graphic filler). These idiosyncratic elements serve as a most convenient tool for distinguishing between different hands which share the copying. Within the bounds of the traditional patterns of regularity and stereotyped conventions of book production, line-ending stratagems provided the Hebrew scribe the chance to express his individuality and creativity. It seems that by the end of the twelfth century, or even earlier in some areas, scribes attitudes toward justification devices had changed: they were not so much concerned with the functional purpose of the devices and were tempted to treat them as an instrument for demonstrating their craftsmanship, inventiveness, and virtuosity. Hebrew scribes in France and in the German lands, who would frequently apply at the end of one line the combined devices of spacing, anticipating a few letters of the fully written word at the head of the next line, truncating the last letter of them, and inserting a graphic filler could have easily replaced the different devices by one practice alone, if their main concern had been to align the ends of the lines as quickly as possible at the margin line and not to exhibit their scribal ingenuity. Similarly, the frequent switches from one practice to another can also be explained by the scribes' urge to display their skilled penmanship. In Yemen the slanting of final words lost its original function when the practice was employed in the majority of the page lines, turning into a sheer decorative device.

Surprisingly, the scribes themselves, in particular in the zones of Christian Europe and especially France and the German lands, eager to show off the richness and proficiency of their skilled art, seemingly did not hesitate to handicap their copying pace and to increase scribal inputs, or even to impair the ease of reading. In general, considerations of fluency both of writing and reading, as well as economic and ergonometric interests of both production and consumption were progressively suppressed in Hebrew manuscripts in favour of aesthetic instinct and scribal virtuosity.

Whatever the reason for the proliferation of devices for preserving the left margin, we are witness to a historical process of the development of the visual design of the text in

Hebrew scripts, and the deterioration of copying fluency. During the periods that preceded the use of the codex – as evidenced in the Judean Desert Scrolls and papyrus and parchment fragments, most of which were found in Egypt and dated to the Byzantine era – no effort was made to stay confined to the rulings of the columns' boundary lines, which served only as a general guide to the textual layout, and by virtue of this fact, no line justification devices developed (apart from some incipient forms in the scrolls) that interfered with the fluency of writing.[29] This trend appears to have persevered for some time after the late adoption of the codex by Jews during the Arab period (presumably in the second half of the eighth century), as the appearance of the few Geniza fragments whose antiquity is unanimously acknowledged suggests.[30] Little by little copyists in the Middle East began to aspire to achieve horizontal lines of uniform length, and in pursuit of this goal the earliest justification devices emerged –

[29] Emmanuel Tov also contends (*Scribal Practices*, p. 100) that the ruling of the left hand margin line in the scrolls helped to achieve regularity in the writing of the columns, even though strict adherence to writing up to this line was not a foremost priority for scribes who used the square script.

[30] This refers to those fragments whose early date is attested not only by their mode of writing but also by other traits, e.g. a few of the palimpsests whose bottom script is Christian Aramaic, Syriac or Greek (See M. Sokoloff & J. Yahalom, 'Christian palimpsests from the Cairo Geniza', *Revue d'histoire des textes*, 8 [1978], pp. 109–132) as well as fragments with Babylonian vocalisation (See a few of the high-quality plates in P. Kahle, *Die hebräischen Bibelhandschriften aus Babylonien,* Giessen 1928) and Palestinian vocalisation (see a few plates in N. Aloni (ed.), *Geniza fragments of Rabbinic literature: Mishna, Talmud, and Midrash with Palestinian vocalization*, Jerusalem 1973). These impressions, of course, require systematic study.

graphic filler,[31] dilation of letters,[32] and eventually anticipation of the word written in full on the next line.[33] The adroit deployment of such devices is in full view in the dated

[31] Graphic filler may have been the first device to develop. One may note a few instances of graphic filler in the copying of Yannai's *piyyutim* in the palimpsests from the Cairo Geniza, although no attempt was made here to adhere to the margin line. See F.C. Burkitt (ed.), *Fragments of the Books of Kings according to the Translation of Aquila From a ms. Formerly in the Geniza at Cairo, Now in the Possession of C. Taylor ... and S. Schechter*, Cambridge 1897, pl. 4, ll. 2, 11, 14, 24(?) (and the same page appears in a smaller scale in the anthology edited by J. Yahalom, *A collection of Geniza fragments of Piyyute Yannai*, Jerusalem 1978, p. 95); Cf. C. Taylor (ed.), *Hebrew-Greek Cairo Genizah Palimpsests from* the *Taylor-Schechter Collection Including a Fragment of the Twenty-Second Psalm according to Origen's Hexapla*, Cambridge 1900, pl. II, ll. 2(?), 10, 11 (Yahalom, ibid., p.99). Uncharacteristically, graphic fillers in the form of a single thickened supralinear dot (or sometimes two) were inserted at the end of many lines, sometimes before the final word and sometimes before and after it, in an ancient fragment of a Tora scroll, formerly kept in the library of Jews' College in London but sold in 1999 by Christie's in New York (microfilm in the Institute of Microfilmed Hebrew Manuscripts in the National Library of Israel, F 11512) as was already observed by Birnbaum who dated the scroll to circa 700. See S.A. Birnbaum, 'A Sheet of Eighth Century Synagogue Scroll', *Vetus Testamentum*, 9 (1959), p. 123 (Birnbaum included this scroll fragment in his *Hebrew Scripts*, vol. 1, no. 91B). Another fragment from this scroll which joins with it, as Mordechai Mishor observed, is a fragment of the Song of the Sea (Exodus 15:1-18) which is kept at Duke University, and was recently on loan at the Israel Museum's Shrine of the Book. See E. Engel & M. Mishor, 'An Ancient Scroll of Exodus: The Re-Union of Two Separate Fragments', *Israel Museum Studies in Archeology*, 7 (2015), pp. 24–61. Recently Mordechai Veintrob detected 13 more fragments of this scroll in Geniza collection of Cambridge; see M. Veintrob, 'More Fragments of Early Torah Scroll Come to Light', *Geniza Fragments*, Newsletter 77 (2019). The use of graphic fillers would seem to suggest that this scroll was not a liturgical scroll. However, graphic fillers that occupy the end of the line or the middle of the line, or even anticipating letters at the end of the line as well as abbreviations in the middle of the line are all evidenced in a recently discovered nearly complete Tora scroll (now kept in a private collection) that was written in 1091/2 (according to the colophon added by the scribe at the end of the scroll) in a script that resembles the script used by scribes who were active during the final quarter of the eleventh century in the region of Puglia in southern Italy, apparently in Otranto. These fillers furnish evidence that the customs governing the writing of Tora scrolls were not fixed even in the eleventh century, in Italy at least. It appears that there was no difference at that time between codices and Tora scrolls as far as copying methods were concerned (except for the appearance of special letters and crowns used later in Tora scrolls), as is clearly demonstrated by the very fact that a colophon was added to the Tora text, a feature that is unknown in any other extant Tora scrolls. In this Tora scroll the scribe even added catchwords at the end of each sheet and even signatures in the first nine sheets beneath the catchword! David Rosenthal (*The Cairo Geniza Collection in Geneva*, *Catalogue and Studies*, Jerusalem 2010, p. 49 fragment 149 [in Hebrew]) observed a graphic filler at the end of two lines on a fragmented sheet of a Tora scroll, and notes in his description that 'it is surprising to find them in a Tora scroll (I am grateful to Angelo Piatelli for drawing my attention to this reference). Another example of graphic fillers at the ends of lines that were inserted into a Geniza fragment of an ancient Tora scroll appears in MS Cambridge T–S NS 2.8. See M. Dukan, *La Bible hébraïque: Le codices copiés en Orient et dans la zone séfarad avant 1280* (Bibliologia 22), Turnhout 2006, p. 85.

[32] Perhaps the earliest example of the dilation of final letters is found in a single surviving remnant (in the Cairo Geniza) of a Hebrew codex made of papyrus (MS Cambridge T–S 6H 9 21), which contains the *piyyutim* of Joseph berabi Nissan of Shave Qiryataim (See Sirat, *Papyrus*, pp. 67-80, and the identification of the text by Ezra Fleischer, ibid., pp. 69-70. The dilations are visible on fols. 6v, 11v, 13v, 20v, 27v, 29v (twice); on fol. 29v a graphic filler shaped like a truncated *alef* may have been inserted (or was this an anticipation of the next word? This cannot be determined because of the fragmented state of the bifolium. It should be emphasized that one cannot discern in the remnants of this codex a trend

biblical manuscripts written in the tenth century. Over time, other devices developed within all the zones where Hebrew scripts were used, and their implementation became increasingly more complex, arriving at its decadent high point in the fourteenth and fifteenth centuries in the hands of Ashkenazic scribes who were also active in Italy. It would seem, therefore, that meticulous investigation of this linear development could provide the study of palaeography with a chronological means of identification for estimating the dates of manuscripts, particularly during the obscure periods – impoverished in terms of codicological data – of consolidation of the Hebrew codex. From the ergonometric and economic standpoints, this development evidently reflects an increasing investment in the production of books.

MS Oxford MS. Opp. 776, fols. 72v^73r. User-produced Siddur. * <Germany> 1471
Written by Asher ben Yitsḥaq who also illuminated the prayer book
(See Suzanne Wijsman, et al., 'Uncovering the Oppenheimer Siddur: Using Scientific Analysis to Reveal the Production Process of a Medieval Illuminated Hebrew Manuscript', *Heritage Science*, 16 March 2018, pp. 1-15

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toward standardizing the length of the lines, and therefore the dilations in question are as yet non-functional. One can observe the dilation of letters in fragments of fairly early Tora scrolls that were re-used in a Greek codex, MS Firenze, Bib.Laurenziana Plut. 74.17. See C. Sirat, M. Dukan & A. Yardeni, 'Rouleaux de la Tora antérieurs à l'an mille', *Comptes rendus des séances de l'Académie des Inscriptions & Belles-Lettres* (November–December 1994), p. 879, pl. VII (rouleau 6). On the appearance of graphic filler signs see the article by Sirat, Dukan, and Yardeni (ibid., p. 864). It seems that even after the appearance of dilations and constrictions of final letters their use was limited in the Orient until later eras. In the Tora scroll written in Italy in 1091/2, mentioned in the previous footnote, especially elongated dilations are visible. Cf. Birnbaum, *Hebrew Scripts*, vol. 1 cols. 173-174.

[33] One cannot find among the Geniza fragments a completion of a line by the beginning of the word written in full at the head of the next line. In any case, this device was already employed in the dated biblical codices of the tenth century since 916. Onward. These monumental manuscripts are outstanding for their use of graphic fillers the lack of substantial dilations and reductions.

Table 35. Geo-chronological distribution of manuscripts records before 1500 whose scribes avoid dismembering words at the end of the line

This table includes tallies only of those manuscripts records in which the scribes avoided dismembering the word, writing letters at a distance from the margin and writing letters exceeding the lines in the interlinear space or horizontally. However, the tallies of the manuscripts records in which the scribes avoided dismembering words does not include those in which the scribes anticipate part of the word which was written in full in the subsequent line, nor do they include records of Judeo-Arabic manuscripts in which the scribes only separated the definite article 'אל' at the end of the lines (compare devices 1 – 5 in the second group of devices).

For the general principles of calculating the statistics and presenting them in tables, see above, in the introduction, the section on 'General statistics of the database' (at the top of Table 5).

The following symbols are used in the Table:

\# number of manuscripts   % percentage of the total regional corpus.

Zone	#	%	Total in corpus
Spain	222	36	619
Ashkenaz	203	52	389
Italy	460	52	893
Byzantium	97	36	266
Orient	282	73	386
Yemen	69	63	109
Doubtful	16	53	30
Total	1349	50	2692

Zone	Period	#	%	Total in Corpus
Spain	1001–1100	5	100	5
	1101–1200	5	71	7
	1201–1300	33	57	58
	1301–1400	42	26	161
	1401–1500	137	35	388
Ashkenaz	1101–1200	4	100	4
	1201–1300	59	69	85
	1301–1400	76	49	154
	1401–1500	64	44	146
Italy	1001–1100	5	63	8
	1101–1200	2	100	2
	1201–1300	34	61	56
	1301–1400	92	61	152
	1401–1500	327	48	675
Byzantium	1101–1200	2	100	2
	1201–1300	3	60	5
	1301–1400	29	38	76
	1401–1500	63	34	183

MS Paris Hébreu 6, Section of fol. 3v
<Germany> 1294/5
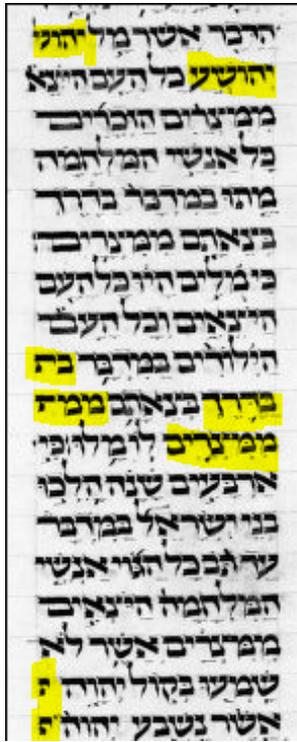
Orient	894/5	1	100	1
	901–1000	11	100	11
	1001–1100	36	95	38
	1101–1200	51	98	52
	1201–1300	60	78	77
	1301–1400	67	68	98
	1401–1500	56	51	109
Yemen	1101–1200	0	0	1
	1201–1300	3	75	4
	1301–1400	22	65	34
	1401–1500	44	63	70
Doubtful	1101–1200	2	100	2
	1301–1400	1	17	6
	1401–1500	13	59	22
Total		1349	50	2692

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Chapter 8: Legibility of the text, transparency of its structure and the graphic hierarchy of its layers
Unrevised version

The task of the Hebrew copyists, like that of their counterparts who copied in Latin, Greek or Arabic script, was not limited to the mechanical transcription of the letters of the copied text but also entailed the visual processing of the text – the shaping of its form and the incorporation of aides to legibility and transparency. This aspect of book production will be presented here chiefly on the basis of the impressions gained from the study of thousands of manuscripts, and only to a small degree on the basis of systematic documentation and quantitative processing. This presentation should therefore be regarded as programmatic in outlining a path for future research which holds the promise of revealing typological and diachronic distinction of value for a portrait of the Hebrew book.

Copyists from all cultural traditions were charged with the responsibility to embody a verbal message within visual structures that affected the comprehension and reception of the text.[1] However, the planning of the codex's size and the ratio of its height to width, as well as the design of the disposition and layout of the text at the book's opening were not only the result of the copyists' independent interpretation or creativity. There is no doubt that the concrete embodiment of the text was also influenced by external material and social factors, such as the writing materials available and their formats, financial constraints, and demands on the part of the commissioners of the copying and their social status,[2] just as they were influenced by

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[1] On the expressive function of typography see D.F. McKenzie, *Bibliography and the Sociology of Texts*, London 1986, esp. pp. 2, 8-9, 12-13, 24, 47 and the literature cited there.

[2] See C. Bozzolo et al, 'Noir et blanc – Premiers résultats d'une enquête sur la mise en page dans le livre médiéval', in *Il libro e il testo – Atti del convegno internazionale, Urbino, 20–23 settembre 1982*, ed. C. Questa & R. Raffaeli, Urbino 1984, pp. 197–221 [=Ornato et ses collègues, *Face cachée*, pp. 417-473].

aesthetic fashions, architectural conventions,[3] considerations concerning legibility,[4] and study needs[5]. Nevertheless, copyists working with Hebrew script appear to have played a part in the structural, interpretive, and artistic design of the texts that was more independent and decisive than that of copyists working with other scripts. This was an outcome of the individualistic character of book production in Jewish society, the widespread scale of literacy within this society, the large proportion of copyists writing texts for self-consumption, and the absence of an authoritative body supervising the copying of texts and guiding their dissemination.[6] These circumstances afforded the Hebrew copyist a larger degree of free choice and personal initiative, despite the aforementioned constraints, although it is clear that when approaching the copying of a widely-used text many copyists would adhere to previously consolidated traditions.

Those learned and creative scribes who could select the form of the text's receptacle, its dimensions, and the ratio of text to size, and who designed the regions of text within the book's openings, effectively endowed the visual appearance of the text with a semiotic function, by assigning meaningful patterns to specific genres and functions of texts and books.[7] The scribes exercised a decisive influence over the comprehension

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[3] For a consideration of the size of books and of the written space and the harmonious ratios thereof, especially in print books, see J. Tschichold, 'Non-Arbitrary Proportions of Page and Type Area', *Calligraphy and Palaeography – Essays Presented to Alfred Fairbank on his 70th Birthday*, ed. A.S. Osley, London 1965, pp. 179–191. For these aspects in respect to Latin manuscripts, see L. Gilissen, *Prolégomènes à la codicologie: Recherches sur la construction des cahiers et la mise en page des manuscrits médiévaux*, Gand 1977, pp. 125–249.

[4] See R. Bergeron & E. Ornato, 'La lisibilité dans les manuscrits et les imprimés de la fin du Moyen-Age – Préliminaires d'une recherche', *Scrittura e Civiltà*, 14 (1990), pp. 151–198 [=Ornato et ses collègues, *Face cachée*, pp. 521-544]. On the ensemble of these factors see Ornato's concluding essay, ibid. pp. 662-648.

[5] The effect of study needs on the visual appearance of the text in Latin manuscripts has been researched in the following works: M.B. Parkes, 'The Influence of the Concepts of *Ordinatio* and *Compilatio* on the Development of the Book', in *Medieval Learning and Literature – Essays presented to Richard William Hunt*, ed. J.J.G. Alexander & M.T. Gibson, Oxford 1976, pp. 115–141 [=M.B. Parkes, *Scribes, Scripts and Readers – Studies in the Communication, Presentation and Dissemination of Medieval Texts*, London – Rio Grande, Ohio 1991, pp. 35–70]; R. Rouse & M. Rouse, '*Statim invenire* – Schools, Preachers and New Attitudes to the Page', in *Renaissance and Renewal in the Twelfth Century*, ed. L. Benson & G. Constable, Oxford 1982, pp. 201–225. Cf. the section of articles 'Glossed Books as an Instrument of Continuity and Change' by several authors in: *The Role of the Book in Medieval Culture – Proceedings of the Oxford International Symposium, 26 September – 1 October 1982*, ed. P.F. Ganz (Bibliologia 4), vol. 2, Turnhout 1986, pp. 75–128.

[6] See above, chapter 1.

[7] Gumbert has commented on a number of non-verbal semiotic aspects of the layout of (Latin) texts and notes that it is not necessary to read the text in order to grasp its nature as either a liturgical or legal text. See J.P. Gumbert, 'La page intelligible – quelques remarque', in *Vocabulaire du livre et de l'écriture au moyen âge – Actes de la table ronde, Paris 24–26 Septembre 1987*, ed. O. Weijers (Études sur le

and reception of texts by virtue of their incorporation of para-scriptural (extraneous to the letters of the script), and peri-textual (relating to the text) elements in the copying. By introducing various punctuation marks, markers for the emphasis of words or terms, for indicating roots or non-Hebrew words, for quotations, lemmata, and all sorts of editorial annotations – all in the form of graphic markings accompanying the script – the copyists facilitated the comprehension of the text and contributed to its reception and usability. By adding headings, initial words (in certain zones even initial letters) rendered in a script several scales larger, as well as running titles at the heads of pages or columns, ornaments, decorations, and illustrations, and tables of contents – all as peri-textual interpretive elements – the copyists were able to improve the text's transparency and convenience of use or study. Similarly, copyists used their copying methods as well as purely visual means to determine the structure of the work and the hierarchical relations between its component parts: they selected appropriate types and sizes of script, divided the work into subsections and paragraphs by means of spacing or used red ink and decorative means[8] to emphasize parts of the text. One may assume that these elements were not present in the original forms produced by the authors or editors of the works or in their early copies, and similarly one must presume that learned copyists and commentators were those that introduced them in the process of transmission to function as indispensable supports of the text's readability, transparency, and usability.

This hypothesis is confirmed by chronological examination of the manuscripts from this perspective, which leads to the realization that these components underwent an evolutionary development. Needless to say, para-scriptural or peri-textual elements are almost nowhere to be found in the Hebrew writings of antiquity, and even in the earliest remains of codices in the Geniza[9], and in a few undated Oriental (especially

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vocabulaire intellectuel du moyen âge 2), Turnhout 1989, p. 111. On the very embodiment of text in visual form as a message in its own right, cf. Parkes, *Scribes*, chapter. 8 ('Handwriting as Image'), especially in regard to the selection of the type and style of the script (pp. 127-145).

[8] The decorative means of indicating the endings of textual divisions was usually realized by rendering the text's final lines in an ornamental form, often as a triangle, as already specified in the *baraita* that recommends ending the writing of a Tora scroll by successively reducing the length of each line: הכותב ס״ת, ובא לגמור, לא יגמור באמצע הדף כדרך שגומר בחומשין אלא מקצר ועולה עד סוף הדף (B. Menahot, 30a). For the variant ועולה instead of והולך which appears in the printed editions, see Glatzer, 'Aleppo', pp. 173-174, and cf. the later halakhic sources, ibid. This form of laying out the final page of a Pentateuch codex had been already used in the Aleppo codex (see ibid.).

[9] See above, chapter 1, note 19.

Babylonian) codices,[10] are merely at the initial stages of development. As an example, we can observe the heading or initial words rendered in a large square script at the head of a text-section, where the body text is in a square or semi-cursive script. This practice was of immense usefulness for searching within the text or studying it, and its later development, i.e. the assignment of different large script sizes for headings and initial words to indicate their hierarchical ranking helped perceive the work's structure. As far as I have been able to ascertain, it seems that in early undated manuscripts, in copies of all the most common literary genres – Bible, Mishna, Talmud, midrashei halakha, halakhic books, piyyut – the headings or initial and final words of the text's units are not made to stand out sufficiently but rather blend in with the copied lines of text. Although these headings are separated by spaces on either side, and are sometimes

highlighted by simple pen decoration, as in the one of the earliest Hebrew codices, *Sifra* with Babylonian vocalisation (see the photograph), they are not written on a separate line, and most importantly they are never written in an enlarged script. According to the dated manuscripts it seems that the custom of blending the heading into the line persevered until the end of the 11th century. Although we do have a single Geniza fragment written in Acre in 1040/41, which already contains a heading written on a separate line in a square script that is
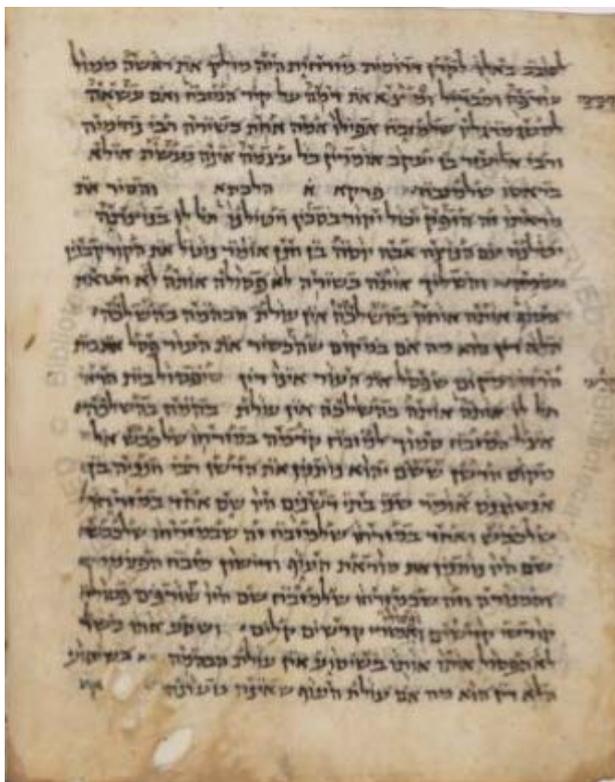
Sifra. MS Vatican Vat. ebr. 66, fol. 16v
Middle East, 10th century or earlier

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[10] E.g. *Genesis Rabba*, MS Vatican Vat. ebr. 30 (a facsimile edition with an introduction and index by M. Sokoloff, Jerusalem, 1971); *Halakhot Pesuqot*, formerly MS Sassoon 263, and currently in the Toronto University Library, MS Friedberg 3-002 (facsimile edition, Jerusalem 1971); *Sifra* with Babylonian vocalisation, MS Vatican Vat. ebr. 66 (facsimile edition with introduction by L. Finkelstein, *Sifra, or, Torat Kohanim: according to Codex Assemani*, New York 1956); *Leviticus Rabba*, MS London Add. 27169 (For a photograph see *Midrash Leviticus Rabba*, M. Margulies edition, vol. 5, Jerusalem 1959/60, after p. xl). The Vatican *Sifra*, based on guiding pricking for ruling the horizontal lines that are within the written space and not in the outer margins, and the non-matching parchment sides, can be be dated prior to the tenth century.

larger than the text[11] the extant dated manuscripts attest that the evolution of the practice of inscribing headings or initial words accentuated by the size of the script, and often by the type of script, can be traced continuously since the final decade of the eleventh century in both the Orient and Occident.

It appears that during the transition from the use of unobtrusive headings to the use of headings emphasized by their isolation on a separate line, the addition of decorative elements, and the use of large script size, there was a period in which headings or endings were indeed emphasized by writing them on separate lines but simultaneously made less conspicuous by rendering them in the same script as that of the text. This was the style used, for example, by the scribe of MS Kaufmann, the most important of all extant manuscripts of the Mishna, whose date of production I investigated many years ago.[12] The scribe of this manuscript inscribed all the headings and all the endings of the tractate using the same uniform script of the text, but also created a hierarchical distinction between them: the headings and endings of the orders (*sedarim*) and the tractates were consistently emphasized by simple decorations and spacings, whereas the headings enumerating the chapter and the halakhot were not decorated, and were sometimes even incorporated at the end of short lines.

Mishna Codex Kaufmann, Order *Tohara*, end of tractate Para and the beginning of tractate *Tohorot*.
MS Budapest, MTA A 50
<Southern Italy, ca. 1100>

From the end of the eleventh century it became a widespread practice to emphasize words written within the line which marked the beginning or ends of textual units: headings, initial words, ending formulae, dictionary lemmata, and so on were emphasized by several methods: spacing, using a considerably larger script, and

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[11] MS Cambridge T–S 8 K 20.3, the end of a *Tafsir* for a selection of words from Biblical books, see *Codices hebraices*, I, Manuscrit 29.

[12] See my article 'Ms. Kaufmann of the Mishna - Its Date and Locality'.*in Collection of Papers on Tanaitic Language,* II, ed. M. Bar-Asher, Jerusalem 1980, pp. 84-99 [in Hebrew]. Cf. the fine facsimile of the manuscript, *Faksimile-Ausgabe des Mischnacodex Kaufmann A50*, ed. G. Beer, The Hague 1929. The criterion of the characteristics of the headings may validate the estimate of the manuscript's early date.

decorating them, from the final third of the thirteenth century, at the very latest, they were marked in the most conspicuous manner by using illustrations and to decorate and illuminae them.

In the Orient the custom spread more gradually than in the Occident and only became widely disseminated in the fourteenth century. In France and in Germany, where the visual expression of the text's structure and hierarchies became highly elaborated, from the thirteenth century on there even emerged a widespread practice which was alien to the spirit of the Hebrew script – of using a larger script to write the initial letter of textual subdivisions, no doubt due to the influence of initials in Latin manuscripts.[13] By comparing the headings and endings of the two manuscripts produced on European soil – those of MS Kaufmann of the Mishna and those of MS Florence of the Babylonian Talmud (and Mishna) from the end of the Order of Qodashim, the earliest among dated Ashkenazic manuscripts, which was written in 1177[14] we can learn of the development that took place between the times of their production. The endings of the textual units, the traditional mode of graphic presentation of the Talmudic text's divisions into tractates and chapters, are almost always written with large letters in MS Florence: the endings of the tractates are always written with an enlarged script on separate lines, and the endings of the chapters are rendered in a script that is larger than that of the text, while the chapter beginnings that immediately follow such endings are sometimes also
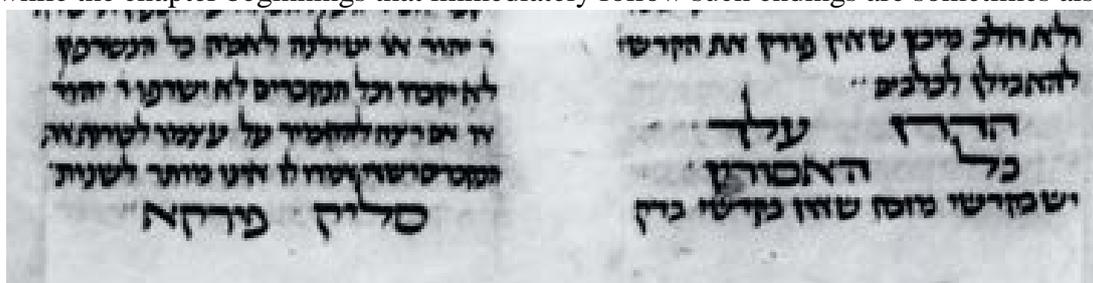
written with larger letters (almost always following the formula הדרן עלך), while sometimes they are written in same script as the text (following the formula סליק פירקא, which normally alternates with the previous formula).[15] In most copyies written in asemi-cursive script in any of the zones, the headings, initial words, and endings were

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[13] This practice was employed in one third of the manuscripts in which opening words or headings were written in a large script.

[14] MS Florence, Bib. Nazional Magl. II-I-7, p. cxxvii ff. (Tractate Berakhot from a different copy heads the bound codex); See *Codices hebraices*, IV, Manuscrit 79, which also includes many original size plates. For a miniaturized photographic edition see Babylonian Talmud, MS Firenze, with an introduction by D. Rosenthal, I, Jerusalem, 1972 (in Hebrew).

[15] A similar structure of the endings appears in five tractates of the Order of Neziqin in two undated bound codices which were adjacent to MS Florenze, Bib. Nazional. Magl. II-I-8-9.

rendered only in a larger script, but also in a square script, a practice which even more greatly facilitated the transparency of the text's structure and its use.

A typical example of this can be seen in the copying of Maimonides' Arabic commentary on the Mishna, which is written in a Sefardic semi-cursive script in the author's own hand.[16] Maimonides, the methodical author who was acutely aware of the limitations of the medieval author who was unable to oversee the dissemination of his works and thus guarantee the trustworthiness of the manually transmitted text version, undertook as his own task to design of the structural appearance of the text. Even in the drafts of his works found in the Geniza, which are written in his unique cursive handwriting, he took care to render the headings in the same type of script but with an enlarged letter size.[17]

As in the case of line management, so with the elaboration of the structural and hierarchical transparency of the transmitted texts, the Ashkenazic copyists demonstrated their creative prowess and personal initiative. From the thirteenth century onward the independent creative output of copyists is clearly evident in certain genres such as maḥzors and prayer books, the multi-layered corpora of basic texts such as biblical books in which the core texts were surrounded by an ingeniously calculated and coordinate mosaic of different commentaries, or anthologies of halakhic treatises accompanied by diverse glosses. While it is possible that

MS London Add. 10456, fol. 144v <Germany> 1348

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[16] The commentary on the Mishna survived in four volumes; two are kept today in Jerusalem, in the National Library, Heb. 4° 5703/1–2 (formerly MS Sassoon 72-73), and the other two in Oxford's Bodleian Library, MS Hunt. 117 (Neubauer Catalogue 393) and MS Poc. 95 (ibid. 404). Cf. the facsimile edition of this manuscript with an introduction by S. D. Sassoon: *Maimonidis Commentarius in Mischnam e codicibus Hunt, 117 et Pococke 295 in Bibliotheca Bodleiana Oxoniensi servatis et 72-73 Bibliothecae Sassooniensis Letchworth* in: *Corpus codicum Hebraicorum Medii Aevi* pars 1., Copenhagen 1956 (in Hebrew and English).

[17] See the numerous plates in the facsimile edition of the commentary of the Mishna which are appended to Sassoon's English introduction (ibid. I). Sassoon's Hebrew introduction and the appended plates have recently been published in a special edition: S.D. Sassoon, *Meḥqar maḳif ʿal ketav yado shel ha-Rambam*, Jerusalem 1990.

in undertaking such projects the learned scribes were responding to particular study needs or uses, there can be no doubt that they themselves designed the patterns and visual meanings which became embedded in these texts for generations afterwards and left their legacy in the print editions. The production of these corpora required not only editorial effort, skill, and sophistication in making such constrained copying, but they also relied on even more complex graphic interpretation and visual hierarchization. Thus, from the middle of the thirteenth century until the middle of the fourteenth century, the copyists of Ashkenazic maḥzors – some of whom even tasked themselves with anthologizing the liturgical-poetic contents of these books and consolidating their text versions in oversize codices – made extraordinary use of five sizes of square script – huge oversize letters for inscribing the initial words of the main sections, very large letters for the initial words of the subunits, large letters for the those of liturgical poems and prayers, uniform letters for the text and even smaller letters, sometimes in a semi-cursive script for refrains and instructions (see the illustration above).[18] Moreover, they also made frequent use of red ink to endow greater emphasis to various elements, as well as of other graphic modes of emphasis, and of course, in several manuscripts they enhanced the structural transparency and ease of use by means of ornamental penmanship, which was undoubtedly performed by the scribe in the course of copying. Similar use was made of colourful and gilded decorations, marginal drawings, and exegetical illustrations of the text, especially at the heads of sections, which were sometimes added by Christian artists once the copying was complete.[19]

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[18] One example of the early development of the visual hierarchy of textual components in the Orient is MS St. Petersburg Евр. II C, Saʿadya Gaon's verse by verse Arabic translation of the Pentateuch, copied by Shemuel ben Yaʿaqov, the scribe of "MS Leningrad" (the earliest codex that contains all the biblical books, which was completed in Cairo in 1008). The manuscript is made of paper and its width is much greater than its length (approx. 320×127 millimetres). The text is composed of three distinct elements in terms of their dimensions and layout: the Hebrew verses are written in a large square script across the line's entire width, the translation of each verse is written in a smaller square script in a narrower column that is centre-aligned underneath the verse, and in the margins in the Masoretic annotations are written in a minute script, and include an abridgment of the *Maḥberet* of Menaḥem ben Saruq (See Y. Ofer, 'A Masoretic reworking of *Maḥberet Menaḥem*', *Lešonenu*, 62 [1999], pp. 189-255).

[19] See e.g. the manuscript of the Worms Maḥzor whose production was completed in 1272 (MS Jerusalem Heb. 4° 781/1), and its facsimile edition. It seems that art historians have not yet devoted sufficient attention to the structural functions of the decorations in the context of Hebrew manuscripts. The structural functions of illuminations and decorations, especially in Ashkenazic maḥzors, have been examined recently by Sarit Shalev-Eyni in her book: S. Shalev-Eyni, *Jews among Christians: Hebrew Book Illumination from Lake Constance*, Turnhout 2010, esp. pp. 10–27. The large proportion of ornamented manuscripts among the dated manuscripts from Ashkenaz (18 percent) stands out in

From the middle of the thirteenth century until circa the middle of the fourteenth century outsize biblical books began to be produced in France and Germany, and Ashkenazic Masoretes commonly decorated their openings with micrographic Masora annotations rendered in interwoven geometric patterns or in the shape of animals and even as rich illustrations.

Outsize Erfurt Bible. Erfurt? (Germany), 1343

MS Berlin Or. fol. 1210

See above, chapter 4, note 8

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comparison with their proportion in Italy (10 percent), Spain (7 percent), Byzantium (5 percent), and their rarity in the Orient.

Decorations and illustrations that improved the transparency of the text's structure and helped locate its elements were also added to de luxe manuscripts produced in Spain and in Italy from the thirteenth century onward. This phase of the book's production was executed after copying was completed by Jewish or Christian artists, as was the case especially in Germany and in France.[20]

MS Munich Cod. hebr. 5
(see n. 20)

[20] That Christian artists were involved in the decoration of de luxe manuscripts is attested not only by the styles of the drawings that art historians have often identified with Christian workshops (This tendency has been questioned recently by M.M. Epstein, in a critical review, M.M. Epstein, 'Re-Presentations of the Jewish Image: Three New Contributions', *AJS Review*, 26/2 (2002), pp. 327–340, esp. 336–337). Indeed, the remains of Latin inscriptions made by plummet in the margins of a few illuminated panels in MS Munich, Cod. hebr. 5, which was written in Germany in 1232/3, and is the earliest extant illuminated Ashkenazic manuscript (and apparently, the earliest manuscript of this kind from Europe), furnishes indirect evidence of the involvement of Christian artists in the production of this manuscript, although contra the view of Suckale who discovered these remains, they were not instructions intended for the Christian illuminator but rather an interpolation of brief descriptions of the illustrations. See R. Suckale, 'Über den Anteil christlicher Maler an der Ausmalung hebräischer Handschriften der Gotik in Bayern', in *Geschichte und Kultur der Juden in Bayern*, ed. M. Treml & J. Kirmeier (Veröffentlichungen zur Bayerischen Geschichte und Kultur 17/88), Munich–New York 1988, p. 130. To the three pages noted by Suckale (ibid.) one should add fol. 37r in volume 1 and fol. 183r in volume 2, as he graciously informed me in a letter dated October 18, 1993. However, evidence for this involvement may also be derived directly from the illustrations themselves: the contours of the letters of the initial word at the beginning of the book of Job (next to the faint Latin inscription Suckale found there) are written by a hand versed in the formation of Hebrew letters, whereas the titles and the initial words within the illuminated`panels are grossly formed and misshapen. It is clear that non-Jewish artists gilded the initial words while distorting their shapes because they were not familiar with the Hebrew script (examples of such distortions in the first volume of the manuscript can be seen above in the photographs: the beginning of Exodus, fol. 44v; the beginning of the לך-לך weekly portion, fol. 9v; the beginning of the וירא weekly portion, fol. 18v). The remains of faint Latin inscriptions in the margins of a maḥzor of Ashkenazic liturgy have been recently discovered in MS Oxford MS. Laud. Or. 321 (Neubauer Catalogue 2373), which was written circa 1275. See E. Frojmovic, 'Early Ashkenazic Prayer Books and Their Christian Illuminators', in *Crossing Borders: Hebrew Manuscripts as a Meeting-place of Cultures*, ed. P. van Boxel & S. Arndt, Oxford 2009, p. 51. Similar evidences have been found in a lavishly decorated, illuminated and illustrated manuscript known as the 'Rothschild Miscellany' (currently kept in the Israel Museum in Jerusalem, MS 180/51). The manuscript, which in fact contains an entire library of useful as well as diverting works, is written in an Ashkenazic script, and was produced in northern Italy in 1479/80 (at a time in which Yo'el ben Shim'on, a famous Jewish artist who was also a scribe, was active). This manuscript contains several miniature drawings of scribes – a common theme in Latin manuscripts,

No doubt the motive for decorating and illustrating the manuscripts did not arise only from the need to demonstrate the textual structure for the reader or facilitate the use of the texts. The aesthetic dimension achieved by decoration, the enhancement of the funder's prestige and social status, and the display of his financial means were presumably central factors in the commissioning of such de luxe manuscripts. Indeed,

the pen decorations by the copyists as well as the decorations and drawings added after completion of the copying were certainly an integral part of the production process of the illuminated or illustrated manuscripts; however, the study of this aspect of bookmaking requires special expertise which goes beyond the scope of the current work.

Pentateuch and Aramaic Targum, Rashi's commentary in the margins, Masora and the 'Tosafot' commentary. <France, before 1348>. MS Vienna, ÖNB Cod. Hebr. 28, fol. 28v

In response the desires of the users of the texts, or perhaps at their own initiative, copyists in Ashkenaz at first, and subsequently also in Spain and in Italy, produced commentated corpora that included columns of biblical text in a square script,

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particularly because of their frequent inclusion of drawings of the evangelists, yet rare in Hebrew manuscripts – and in all of them the scribe is depicted writing from left to right. Moreover, in quires that included a large number of illustrating miniatures for *Meshal ha-Qadmoni*, the illustrations were numbered with Indo-Arabic numerals (unlike the letter numerals in use among the Jews) written from left to right. See M. Beit-Arié, 'A Palaeographical and Codicological Study of the Manuscript', in *The Rothschild Miscellany*, vol. 2: *A Scholarly Commentary* [Companion volume to a facsimile edition], Jerusalem–London 1989, pp. 97-100. In this context one should mention the method of writing initial words that was customary especially (or exclusively?) among Ashkenazic scribes, and which has begun to come to light in recent years. In the margins opposite the initial words there have been found the same initial words written in a cursive minute script, or what remained of them after being cut in the process of binding. This suggests that these copyists did not write the initial words in the course of their copying, presumably since their writing implement would have needed to be substituted with a thicker one, but rather just marked the words in the margins in order to return and fill them in upon completing the copying (indeed, in some manuscripts one finds that the scribe skipped over the insertion of an initial word because he did not notice this visual reminder). See ibid. pp. 99-100 [=pp. 187-188]. This issue is discussed in greater detail in chapter 9 below.

and facing them at times columns of the text's Aramaic translation in a smaller script, surrounded by a number of popular commentaries that were copied in a smaller (even minute) semi-cursive script, corresponding to the interior text.


Early Prophets with the commentaries of Rashi, RaDaK (Rabbi David Kimḥi, and RaLBaG

Segovia (Spain), 1484 * MS Oxford MS. Kennicott 5, fol. 46v

Similar to the commentated Biblical corpora, in France and Germany halakhic books were assembled incorporating several layers of annotations, often with interwoven decorations, whose level of importance was conveyed by the size and type of script in which they were written (square, semi-cursive, or cursive). Copyists in Spain,

Provence, and in Italy developed peri-textual semiotic systems, although they were generally less complex.[21]

A glossed and commentated prayer book according to French rite.
<France>, 1395-1398
MS Vatican Vat. ebr. 324, fol. 3v

Asheri by Asher ben Yeḥi'el with interpolated glosses by Israel Kermez

<Germany>, 1460 * MS Paris Hébreu 417, fol. 120

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[21] On the multi-layered copyings as well as a selection of illustrative photographs, see Beit-Arié, *East and West*, pp. 85-99.

In regard to this issue, it is interesting to observe the progressive weakening of the avoidance of hierarchizing biblical text, and the spread of the practice of writing initial words in biblical books, particularly at the beginnings of books, in large letters that were sometime decorated, and moreover, were illuminated with marginal drawings and illustrations. Whereas during the first centuries of the spread of biblical codices in the Orient, calligraphic codices were decorated, the initial words of the biblical texts were never rendered in a large script, and only the Masoretic annotations and lists, or colophons, were decorated. This aversion to tampering with the uniformity of the biblical text began to be upset already at the end of the twelfth century, as witnessed by the dated manuscripts, and the practice of writing initial words in a large script and even decorating them spread quickly. The phenomenon is visible in books produced especially in France and the German lands and eventually, with the diminishing of Islamic influence and the increase of Christian influences, also in the Iberian peninsula, Provence, North Africa and Italy. However in the Oriental lands, which had always been permeated by Islamic culture, the phenomenon was rare.

There is no doubt that the scribal contribution to the readibility of the text clearly indicates a process of incremental improvements. In the period of the consolidation of the Hebrew codex the text was embodied in blocs of uniform text with unobtrusive headings, and the reader was not equipped with any kind of aide to facilitate reading and studying or to visually display the structure of the work and the hierarchy of its components. However, over the course of generations such aides to interpretation grew in number and complexity. We have illustrated this progress by focusing on a single factor – the emphasizing of initial words and heading and the deployment of a wide range of script types and sizes in order to hierarchize the text and increase the transparency of its layers. However, this progression can also be proven based on the development of other peri-textual and para-scriptural elements, including the expansion of the system of punctuation marks and the differentiation of their functions; the development of the use of marking and simple decoration above words in order to highlight words, concepts, foreign language words and biblical citations; the writing of running headers on each folio; the revolutionary practices of numbering the sections of a work, especially of halakhic works; and the addition, usually at the front of a work,

of a table of contents.[22] All of these embellishments contributed to the readability and comprehension of the texts, immeasurably improved the perception of its structure, the ease of use, and the speed at which items of interest could be located. Their development attests that indeed this aspect of the history of Hebrew manuscript production reflects a lengthy evolutionary process that accelerated significantly during the thirteenth century.

The following paragraphs provide detailed examples of the systems of graphic marking and signs that were added to the text in order to facilitate its comprehension.[23] Every critical user of manuscripts, and editor of text in particular, should be acquainted with these markings and their meanings. Anyone inspecting a manuscript should examine the method and functions of the graphic signs implemented by the copyist.

Punctuation system[24]
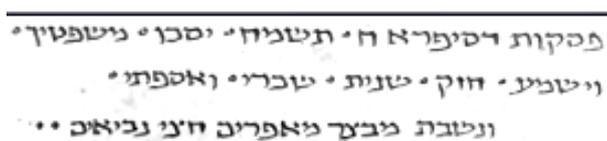
The punctuation system relied chiefly on the use of one sign – an upper dot (or tag, etc.) signalling the end of the verse, which was positioned on the same plane as the letters' upper strokes[25]. In many manuscripts the punctuation system used a single sign

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[22] These last two elements require careful study: were these useful aids prepared by the authors or by ther users?.

[23] The diverse graphic forms of these visual aids as well as the shapes of the graphic fillers and substitutes for the tetragrammaton were copied and recorded in the questionnaires used by the Hebrew Palaeography Project to document the findings from dated manuscripts or from manuscripts bearing the names of their copyists; however most of these documented forms were not sorted or coded with the aim of integrating them into the database. Partial attempts – albeit of considerable scope –by M.A. students to classify forms used for graphic filler and highlighting (including tetragrammaton substitutes, which will be discussed below) and to establish typological conclusions on this basis encourage the continued effort to produce a systematic full-scale classification of such forms. However, all these uncoded graphic elements can be seen in the scanned questionnaires accessible in SfatData website.

[24] See the only study to date of this issue: S. Toran, 'The History of Hebrew Punctuation – Introductory Chapters', *Tarbiz*, 71 (2002), pp. 449-530 (in Hebrew). For the development of punctuation in Latin manuscripts see Parkes, *Pause and Effect*. An initiative was started recently by ISO (The International Organization for Standardization) to add punctuation fonts to computer word processors, according to their appearance in the medieval Latin (and Iranian) manuscripts.

[25] In a fragment of a *piyyut* from the Cairo Geniza, MS Cambridge T–S NS 198.9, the pause mark is not made at the 'roofline' of the letters but in the middle of the line's width. In an ancient Geniza fragment from the Mosseri collection II.262.2 (currently kept on loan at the Cambridge University Library) the paragraphs (stanzas) were marked in the form of a Z.

uniformly for all types of pauses, without distinguishing between a pause at the end of a sentence or a longer one at the end of a paragraph or textual unit (such as a chapter, article, or book). In the early Oriental manuscripts and apparently also in the early Italian ones the punctuation of longer units was rendered by a sign that was not based on upper dots (usually these were circles, as in the Genesis Rabba manuscript, written apparently in Italy at the end of the eleventh century, reproduced below).[26]


Genesis Rabba. MS Vatican Vat. ebr. 30, fol. 106v

Sifra. MS Vatican Vat. ebr. 31, fol. 11v
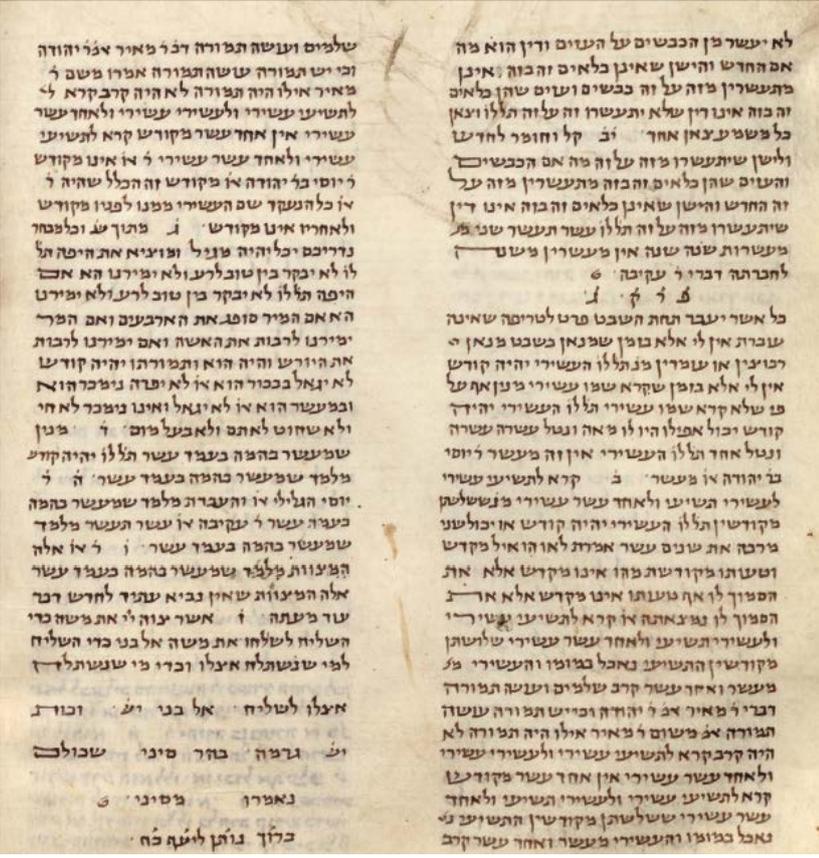
In the earliest extant dated manuscript from Europe – the manuscript of the *Sifra* written in 1072/3 – one can observe a uniform system of punctuation that employs a single

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[26] The editorial markings collected by Rosenthal (*Muslim Scholarship*, pp. 15-17) based on Arabic sources include a guideline to mark a pause between passages or sources with a circle with a point at its centre. For the punctuation system of Arabic manuscripts that included only a full pause at the end of a sentence marked by a full circle, a practice borrowed from Persian manuscripts, see A. Grohmann & T.W. Arnold, *The Islamic Book: A Contribution to its Art and History From the VII–XVIII Century*, London 1929, p. 23 (cited in a work by Muhammad Jamil 'Islamic *Wirāqah*' [above, chapter 3, note 58], p. 233).

upper dot; however, at the end of the chapters the copyist made a marking of an incomplete circle. In Oriental biblical codices the marking the ends of paragraphs of the Masora Magna with a circle was already widespread in the tenth century. This tradition was brought to Europe and survived there in the writing of the Masora (especially in Ashkenaz).

In many manuscripts, especially later ones, one finds a system of dual-marking punctuation whereby each of the two types of punctuation was assigned a mark of its own – an upper dot to indicate a short pause and two upper dots to indicate a long pause (a paragraph or stanza) (see the photograph of MS Vatican Neof. 2, fol. 33v, which was written in 1473 in Spain, most probably in Qal'a Ayyub [Catlayud]). A small number of manuscripts employed a triple punctuation system, in which a particular mark was assigned to one of three types of pauses – an overhead dot for brief pauses, two overhead dots for long pauses, and two overhead dots with a third dot above to indicate the ends of large textual divisions such as chapters.
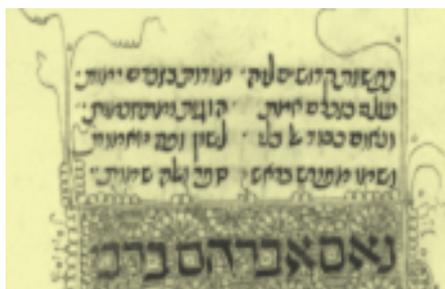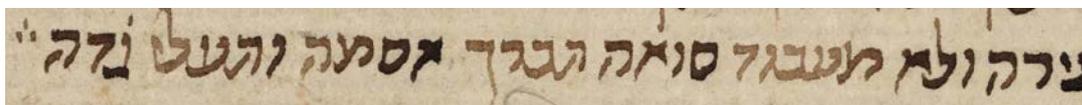

Accentuation of words, proper nouns, and terms in the body text, or headings and endings of textual units not rendered in a large script

In medieval manuscripts a tradition developed whereby words in the body of the copied text were accentuated or specified by means of marks or simple decorations placed above the emphasized words. One finds this form of highlighting on prayer instructions, all sorts of terms, grammatical roots in dictionaries and grammatical works, names of letters, numbers that are always rendered in Hebrew letters, and foreign language words (לעייז).[27] Indeed, some overhead marks of this kind were intended only to emphasize the

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[27] The diverse marking shapes used in manuscripts to emphasize words such as names of letters or of the *sefirot* or non-Hebrew words made their way into print editions, but because it was difficult to reproduce their precise shapes in print they were conflated into a single sign in the form of initials mark. This is why such words are written to to this day, as if they were acronyms. See M. Beit-Arié, ``Al ketivat sehmot ha-otiyyot (he'ara)', *Leshonenu La-'am*, 33 (1982), pp. 95-96 (in Hebrew).

marked words, but others were no doubt intended to differentiate between regular words and combinations of letters that resembled those words, and to prevent their being read as plain words. This is apparent in the case of marking roots, names of letters (which may be construed as meaningful words), numbers, the designations of the Kabbalistic *sefirot* and certainly in the case of non-Hebrew words, which would prevent comprehension without a device signalling their difference. Within halakhic and exegetical texts that were written in the Ashkenazic regions (especially in France), which included many foreign words, place names were also marked, and in a few cases also the names of scholars. Even in the absence of a comprehensive classification system it is possible to distinguish the graphic types of markings that are unique to this or that region, especially those used in Ashkenaz and in Spain.
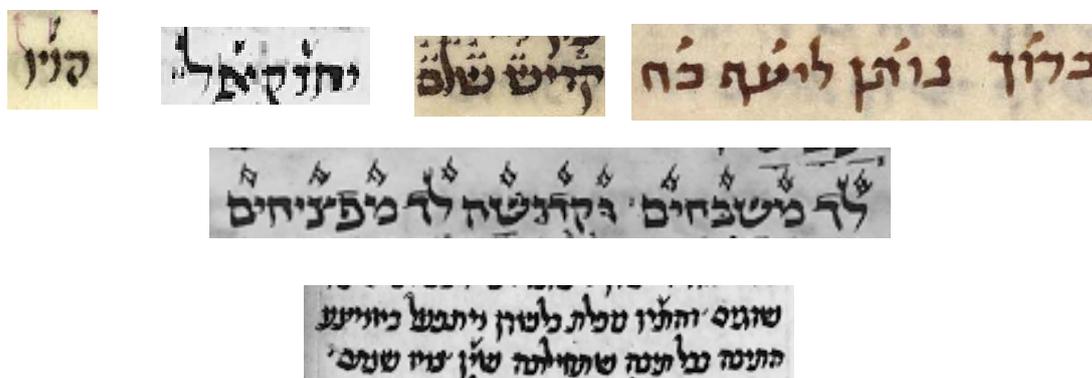
Marking of biblical quotation and lemmata

The markings indicating a quotation of biblical verses and lemmata, like the other text-related markings, are inscribed above the words, usually in the form of two horizontally positioned points.[28] These marks, which were undoubtedly added by the copyists, greatly facilitated those who read or consulted the text.

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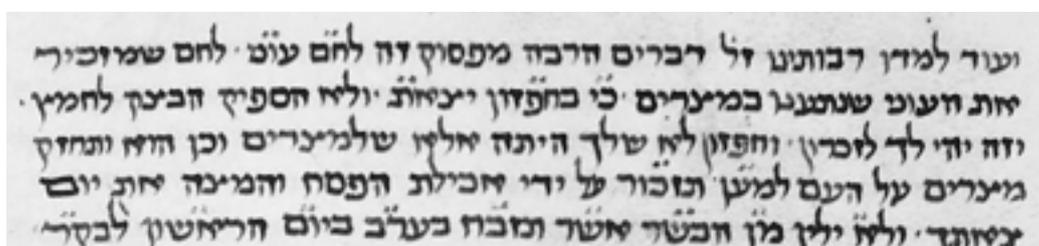
[28] In letters found in the Geniza the letters of biblical versess cited from used to be marked by supralinear points as well as other markings. See e.g. M.A. Friedman, 'Poligamy – Documents and Responsa from the Geniza', *Tarbiz* 43 (1973/4), p. 189, note 101 (in Hebrew). See ibid. for allusions to halakhic contexts of this practice concerning the writing of Biblical verses without guiding rulings.

Proofreading marks

Inherent to the act of copying is the occurrence of errors which are then corrected within the manuscript whether in the process of writing or later, either by the original scribe or by others. The primary requirement from the reader of a manuscript, and certainly from the person preparing an edition, is to be able to distinguish between the system of proofreading marks used by the copyist himself, and those used by later hands. It is not simple in every case to distinguish between the markings in this manner, but it is vital for understanding the archaeology of the text from the time of its first copying and through its uses over the ages by scholars who proofread and annotated it. First one must observe whether the original copyist proofread his own copying. The copyist may have sporadically proofed his own writing upon noticing an error or elision during the copying, or he may have proofread the written text systematically upon completion of the copying. Manuscripts that were systematically edited are rare, whereas as manuscripts that were edited on the fly are common. When the copyist used the same type of script for his corrections that he had employed in the copying – whether a square or semi-cursive script — the attribution of the proofreading to the copyist is made easy by comparing the shapes of letters as well as para-scriptural elements such as accentuation marks and graphic fillers. However, even when a text was written in a square script and the proofreading marks are rendered in a different script type, the marks might still permit their attribution to the proof-reader. The texts in vocalised manuscripts of the Bible (to which the Masora was also added) and of vocalised maḥzorim, especially from Germany and France, were proofread by the Masorete-vocaliser while he was adding the vowel points to the text, as is clearly evident in biblical manuscripts, since the correction of the biblical text were written in the masoretic script.[29] In the preparation of scholarly editions it is necessary to expose the late proofreading strata by careful comparison between the graphic methods of proofreading markings that the users of the manuscript added over time, and to attempt to differentiate between the hands of these proof readers by presenting the added layer of corrections in their scholarly editions. It is important to carefully examine the system of the various proofreading marks within the manuscript's pages and to document them.

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[29] For the distinction between the copyist's proofreadings and annotation and those made by the vocaliser see Beit-Arié, 'Worms'. pp. xiv-xvi.

Frequently each type of proofreading operation had its own graphic mark. Most of the markings appear above the corrected words.

Detailed below are the most common types of proofreading corrections in Hebrew manuscripts and their chief corresponding markings.

a. Cancellation of letters or entire words.

Words and letters were not erased with a pen stroke, but by markings usually composed of overhead points, a custom related to the letters with a point overhead that appear in the Masoretic text of the Bible, which were already used in the Dead Sea Scrolls.[30] At times two points were written – one above and one beneath the letter.[31] Sometimes the cancellation of words was performed by drawing a line above the word (in the example below from an Oriental manuscript from 1279 – the lines are slanted).
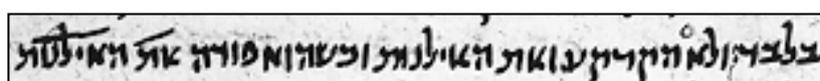
In vocalized Ashkenazic manuscripts in a square script, when there was a need to eliminate the plene orthography (added *vav* and *yod*) as required by grammar or in order
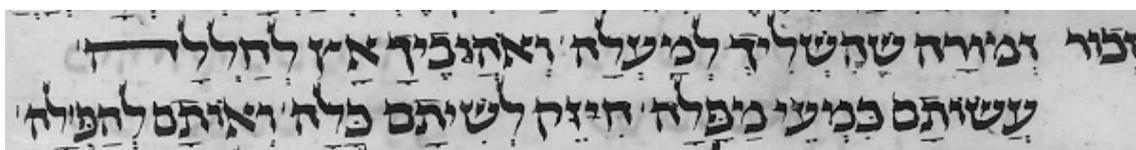

to erase other letters, the vocalisers used to make the mark of an incomplete circle and sometimes to draw a line through the body of the letter (in the segment show below: ואהוביך in the first line; חיזק in the second line).

b. Correction or substitution of words

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[30] *The Dead Sea Scrolls of the Hebrew University,* ed. E.L. Sukenick, Jerusalem, 1955, p. 3 (In Hebrew). For the marking of superfluous words with points above and below the letters see M. Glatzer ('Aleppo', p. 222) who cites the rabbinic midrash in *Avot de Rabbi Nathan* according to the S. Schechter edition (*Two versions of Tractate Avot de Rabbi Nathan*, New York 1967), which I cite here by combining the versions: עשרה נקודות בתורה <...> ולמה נקוד על כל האותיות הללו? אלא כך אמר עזרא אם יבוא אליהו ויאמר לי מפני מה] כתבת כך אומר לו אני כבר נקדתי עליהן (p. 101 [version a], p. 98 [version b]). For the practice of cancelling letters in Greek manuscripts by writing points above and below them, see B.A. Van Groningen, *A Short Manual of Greek Palaeography*, Leiden 1940, p. 53. The same occurs in Latin manuscripts (where it was customary to draw a line across the word), see L. Havet, *Manuel de critique verbale appliquée aux textes latins*, Paris 1911 [repr. Rome 1967], p. 376, § 1506.

[31] This practice is in evidence already in the Judean desert scrolls. See M. Martin, *The Scribal Character of the Dead Sea Scrolls*, vol. 1, Louvain 1958, pp. 154–160.

Correction of words and alternative words were not written in the text's interior space but rather in the margins. Within the line, the words in need of correction or substitution were usually marked overhead by a graphic mark of emphasis, and the corrected or substitute words, which were always written in the margins, were also marked overhead by a similar emphasis mark.[32]
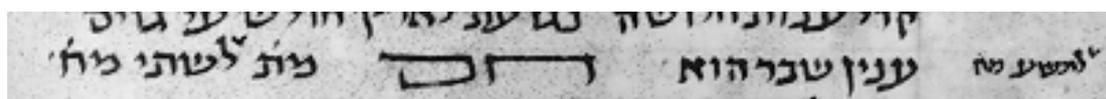
Over time scribes developed the tendency of forming these markings as a tailed circle. When the circle was inscribed in the body text the tail pointed to the margins, and in the corresponding marginal annotation the tail pointed back toward the text (an example of such a mark to indicate elided words can be found in the multi-layered Rothschild Miscellany, see below section d).

In the following example from the *Mishne Tora*, which was copied in Narbonne in 1282, words were cancelled by means of two horizontally positioned points overhead, and were substituted with other words written in a minute script in the margins. The location of the insert point was indicated by two overhead vertical points (see below).

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[32] For the marking of the substituted word with sublinear points in the scrolls, see ibid. 160-161. This practice is mentioned by Rabbi Isaac ben Moses of Vienna (aka Rabbi Yitzhaq Or Zaru`a) in his famous description of the circular marking used by Rashi while editing a commentary written in his own hand: כי ראיתי בפירושים שכתב בכתיבת ידו הקדושה שלכתחלה כתב כך <...> בשאובין ליתא, ומחק שאובין וכתב למעלה על שאובין ביני חיטי בצנור, ועשה על תיבת ליתא ציון כזה ⊙ וכתב על הגיליון שאין כאן שיעור (Isaac ben Moses, *Sefer Or Zaru'a,* Zhytomyr 1862, section 61).

c. Transposition of letters in within a word or transposition of words

The transposition of letters or words is usually indicated by minute points written above the letters or words, but these proofreading marks escape the notice of many readers because they nearly inconspicuous. A single point indicates that the letter or word should come first, two vertically positioned points indicate that the words must come second, and sometimes the transposition marking includes a third word. In a few manuscripts the marking is indicated by letters (as in the figure below).[33]
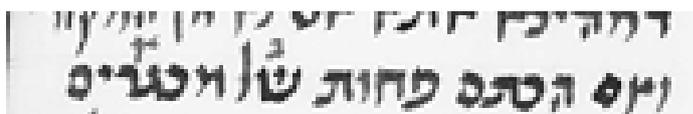
d. Insertion of elided words

Elided words are usually treated in the same manner as corrected or substituted words, but in some cases the markings are distinct.[34] In the multi-layered Rothschild Miscellany, for example, the insertion of elided words is marked by a tailed circle.

e. Separation of fused words

Copyists tended to mark words that had been placed too closely together with supralinear points or with both supra- and sublinear points positioned between the fused words in order to separate them. The markings were usually made with two vertical or slanted points.[35]

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[33] *Sefer Ḥasidim* prohibited this practice (as it prohibited other scribal practices) in biblical and liturgical texts: בי׳ למעלה יכתוב לא <...> הפסוקים או האותיות או התיבות להפך הסופר בהם שכתב וכתובים נביאים תורה שטעה מה ימחוק אלא המוקדם קודם המאוחר לקרוא כדי להפך שנכתב האחרת התיבה על וא׳ הראשון על ואל לפניו כתוב שרואה כמו יקרא בפיו שגורה שהתפילה מחמת כי שמתפללים וברכות בתפילות וכן <...> כסדר וכתב הקלף על הסופר יחוש (section 610). The prohibition attests, of course, to the fact that the practice was widespread.

[34] Cf. the responsa of Rabbi Nissim Gerondi השיטה באמצע פסוקים או תיבות הסופר בם השמיט תורה ספרי (Nissim ben Reuben ספרים בשאר הסופרים כמנהג ההשמטה לסמן עגולים או נקודות ותלה לדף דף בין וזרקן והגיהן Gerondi, *Responsa*, Rome 1545, section 39, fol. 31a).

[35] This custom is already seen in the Judean Desert scrolls. See Martin, *The Scribal Character of the Dead Sea Scrolls* (above, note 31), p. 164. Martin describes the marking as indicating the transfer of the last letter to the beginning of the following word. Cf. ibid. (pp. 195-198) a summary of the point markings in the scrolls. In ancient Semitic inscriptions words were always separated by points, and this was the

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f. Marking of alternative versions

Sometime the margins were used to add textual versions that diverge from the text written in the centre of the page. The word within the core text to which the variant referred was marked by one of the graphic markings used for proofreading. The variant inscribed in the margin is prefaced by the heading נ״א (נוסח אחר – a different version) or ס״א (ספרים אחרים – 'other books'). A suggested emendation to the text was prefaced with the heading נ״ל (נראה לי – 'It seems to me). Such annotations were most commonly added by later users, although we see a few examples of copyists who went to the trouble of adding a critical apparatus of sorts to document textual variants in the margins by means of graphic markings.[36]

practice in Latin inscriptions as well . See P. Saenger, 'The Separation of Words and the Order of Words: The Genesis of Medieval Reading', *Scrittura e Civiltà*, 14 (1990), pp. 65–67.

[36] For copyists who reported that their copying was made by the eclectic use of several manuscripts as their *vorlage*, see below, chapter 13.

Chapter 9: The affinity between the copying of the text and its decoration, illumination and illustration
Unrevised version

This very short chapter does not discuss the decorations, illuminations, or illustrations

Psalms with Avraham Ibn Ezra's commentary in the margins Italy, late 13th century MS Parma Parm. 1870, fol. 191v

appearing in Hebrew manuscripts as topics in their own right. The exposition of this dimension of production in respect to the regional, historical, stylistic, and iconographic characteristics of the manuscripts requires specialized expertise which is the domain of historians of Jewish art; for more than just receptacles for texts, manuscripts were also handsome *objets d'art* and sumptuous, expensive and prestigious treasures. In the

previous chapter we discussed the functions of pen decorations, colourful illuminations, and illustrations that helped render the text's structure transparent by visually exhibiting the hierarchy of its elements, and which facilitating the text's use by enabling the quick perception of its component elements and their boundaries. The present brief discussion addresses the methods by which decorative and pictorial elements were integrated in the workflow of the book's production and the operational relationship between the copying a text and its decoration.

We preface the discussion by pointing out that even the use of basic scribal means for rendering transparency to the text and its structure, i.e. the writing of initial words and headings employing several scales of enlarged and usually square letters entailed the disruption of the fluency of copying and the application of a specially orchestrated workflow. The employment of a large script – especially a large square script – for writing initial words and headings in the midst of copying a text written in a smaller square script, and certainly whilst copying a text in a semi-cursive script, entailed the

use of a different pen, one with a broad nib and perhaps also a differently cut slit in the nib, which would allow the drawing of thicker and differently styled pen-strokes; at times, for the execution of an hierarchically arranged scale of script sizes, several pens might even be required. From an ergonometric point of view it is difficult to conceive of hired scribes and copyists writing for their own use producing the text, headings, and varying sizes of enlarged initial words in a single unbroken flow of work while switching pens frequently. They therefore selected a mode of writing the remains and traces of which have survived not in a few manuscripts. A keen eye is able to discern at the margins of the pages, especially decorated ones, written reminders or cues some complete, others mere traces – including micro-inscriptions of the opening words themselves. These cues permitted the writer to avoid interrupting his flow of copying with frequent switches of the type of pen he was using, and to leave suitable spaces where, once the copying was completed, the initial words inscribed in a micro-script in the margins would be inserted and scaled to the appropriate size during one additional pass in which the scribe would use a broad-nibbed or other type of pen. It should be stressed that in order to copy multi-layered texts cantering on a biblical, talmudic, or legal text – usually written in a square script or a larger script – and accompany them with commentaries written in a much smaller semi-cursive script, it would be absolutely necessary to switch pens. This technical constraint, too, in addition to the fact that the layout of the accompanying text was dependent on that of explicated text, makes inescapable the conclusion that the accompanying texts were written as a separate stage. This method, familiar from Latin manuscripts in which initial letters were decorated by the scribe or by an illuminator with cues for the initials placed in the margins,[1] was also employed by Hebrew scribes to mark initial words written in a large (and sometime semi-cursive) script. Unfortunately, the extant manuscripts have preserved only remains of these inscribed cues, since most of the micro-inscriptions intended for the later insertion of the initial words were written in the page's outer margins; as is well known, these outer margins were subject to trimming during the book's first binding and again with subsequent re-bindings, and therefore most of such guiding cues were

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[1] See W. Wattenbach, *Das Schriftwesen im Mittelalter³*, Leipzig 1896 (repr. Graz 1958), p. 345. On indicating the colour of the initial letter see L. Gilissen, 'Un élément codicologique méconnu: L'indication des couleurs des lettrines jointes aux "lettres d'attente"', *Paléographie 1981 – Colloquium de Comité International de Paléographie, Munich, 15–18 September 1981*, ed. G. Silagi, Munich 1982 (Münchner Beiträge zur Mediävistik und Renaissance-Forschung 32), pp. 185–191

trimmed off. One may surmise that the reason the copyists chose to write the cues in the outer margins, sometimes even at a distance from the actual opening words (for example on recto pages whose initial words are at the head of the line on the right) is that the outer margins are broader than the inner ones and provide more ample space for writing. However, it is also reasonable to think that the inevitable trimming of most of these inscribed cues was favoured by the copyists, who, one must assume, hoped the scaffoldings of their copying would be removed, and indeed wrote the cues near the edge of the margins so they would be trimmed by the binder. As a matter of fact, I first noticed this phenomenon because of a few cases in which such cues for initial words were written in the inner margins, which of course were not trimmed. Inscriptions such as these, which were written in the outer margins in a micro-script, and have rarely survived in complete form and more frequently survive as fragments – those with trimmed endings showing only the beginning of the initial word on the recto pages and those with trimmed beginnings showing only their endings on verso pages – their very survival indicates that this method was followed by the scribe at every stage of his copying. The phenomenon has been observed in quite a few manuscripts, but one must assume that in many cases it has escaped our notice because its remains are so rare and fragmented. In a number of instances one sees this method implemented in the writing of headings in large letters, usually in a square script.[2]

Presumably, the writing of initial words was skipped over during the main stage of copying, only to be completed later, in most of the manuscripts where such words are rendered in a much larger script (usually square, but not exclusively so). Most of the initial words were written with the same ink the copyist had used for the text, but at times the words were added in a coloured ink; here the necessity of writing the cues in the margins of the pages is even clearer, since the writing of the initial words involved not only a change of pen but also of ink. An instructive example can be seen in MS Paris Hébreu 40, written by Moshe ben Yehoshu'a Merkes in a semi-cursive

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[2] Inscribed cues for headings can be seen, for instance, in a manuscript written in 1470, MS Paris Hébreu 1172 (*Manuscrits médiévaux*, I, 129): in the margins of two pages (fols. 9v, 21r), in which no headings appear although written spaces had been left for them, and in the margins of fol. 95v in which a heading is written in violet ink. Simcha Emanuel observed the micro-inscriptions in the margins of the many headings written in red ink in the manuscript of *Sefer Mordecai* which was written in northern Italy in an Ashkenazic script in 1457 (MS Vercelli, Seminario vescovile 1) and kindly informed me of them. This practice may have been employed chiefly by Ashkenazic scribes.

Ashkenazic script in Italy in 1473/4.[3] This manuscript contains remains of numerous written cues reminding the scribe to insert later the initial words. Moreover, these inscriptions attest to their own purpose very clearly. They are not to be found in the margins of the pages opposite initial words written in a semi-cursive or square script in letters that are only slightly larger than the text's script, since in these cases the scribe would not have needed to switch pens in order to write them; rather, they were inscribed in the margins of pages opposite initial words that were written in a large square script with red ink, where it is clear that both pen and ink needed to be changed in order to add them.

Traces of this practice are clearly visible in lavish decorated manuscripts, in which many of the initial words were coloured or gilded, illuminated by colourful plates or even illustrated. Two examples that effectively demonstrate the use of marginal scaffolding in a small cursive script can be seen in two comprehensive and splendidly illuminated miscellanies, the first from the north of France in the late thirteenth century, and the other from northern Italy during the Renaissance.[4] It might plausibly be inferred that in cases where minute cues were found in the margins opposite gilded or illuminated opening words, these were intended for artists who at a later stage inserted the illuminated opening words. But such a conclusion would be unfounded and mistaken. The partial peeling of the gildings of the letters, colours, or illuminations clearly reveal the scribe's own writing in which he inserted the words with his pen (usually with the same ink used for his copying); only afterwards could the decorators (and even the scribe himself) gild, decorate, or illuminate them.[5] That the micro-

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[3] See *Manuscrits médiévaux*, I, 134.

[4] Both Miscellanies have been published in facsimile printings. The French Miscellany in included in London Add. 11639. On the process of its production, see Beit-Arié, 'The Making of the Miscellany', in *The North French Hebrew Miscellany (British Library Add. MS 11639) – Companion Volume to an Illuminated Manuscript from the Thirteenth Century France in Facsimile*, ed. J. Schonfield, London 2003, pp. 47–73. For a discussion and analyses of the phenomenon in question in this miscellany, see ibid. pp. 66-67. The multilayered French miscellany has cues in the margins that guided the writing of the gilded initial words only in the copying of the books of Psalms and Job that were copied in the lower margins. The lavish Rothschild Miscellany, which was completed in 1479/80 in northern Italy, is included in MS Jerusalem, Israel Museum 180/51. For its production see: M. Beit-Arié, 'A Palaeographical and Codicological Study of the Manuscript', in *The Rothschild Miscellany*, vol. 2: *A Scholarly Commentary* [Companion volume to a facsimile edition], Jerusalem–London 1989, pp. 91–124, and for a discussion of the phenomenon described here in this miscellany see ibid. pp. 98-100 [=Beit-Arié, *Makings*, pp. 188-189]. For the date of this manuscript see above, chapter 2, note 39.

[5] This production sequence for writing illuminated manuscripts – the unavoidable necessity of writing initial words and headings in pen before decorating them – is sure to be uncovered by means of special photographic technologies such as X-rays.

inscriptions were intended for the copyist alone is also implied by cases in which the initial words and heading were not written at all in the body-text despite the reminders placed in the margins.

Our discussion should address the need for and potential of revealing the codicological phases of combining and coordinating the copying of a text with its decorations and illustrations, beyond the mere illumination and decoration of the initial words in panels or in the margins. The stages and sequencing of this combinatory process must be elucidated for each manuscript individually. A number of Sefardic Bibles include at the front a decorated and illuminated quire containing the summaries of the Masora or biblical illustrations. An examination of their codicological traits suggests that this quire was produced separately. A similar examination of the abovementioned French Miscellany reveals that there is a conspicuous difference between the parchment used as the writing material for the quires with full page illustrations and the writing material used for the manuscript's body-text; this indicates that these quires were produced separately and incorporated later, a conclusion that is compatible with the iconographic analysis. Judging by the degree of correspondence between the illuminated and illustrated surfaces and the copied text one can of course infer the phases of production of these illuminated manuscripts.

The manner in which decorations and illustrations are integrated into spaces of the text allows one to decipher the manuscript's production stages. Naturally, the copying of the text preceded its decoration. In most cases it is apparent that the copyist wrote with the awareness and intention that his copying would be decorated and therefore planned the layout of the text in advance: by leaving empty, undecorated spaces here and there, he determined the locations for the integration of the decorations and illustrations and defined the boundaries of their surfaces within the area of his copying. At any rate, whether or not the copyist had planned how to embed the decorations and illustrations, if we do not discern invasions by the decorations into the bounded text regions and divergences from the copying's outline, then it is clear that the layout of the decorations and illustrations was tailored to fit the forms of text's outline, and it follows that the decorations were added subsequent to the copying and were adapted to its boundaries.

On the other hand when a decoration extends into the text's region and the copying strays from the normal outline in order to contain the decoration it is clear that the decoration was made prior to the copying (see the adjacent photograph of MS London).

MS London Add. 11639, fol. 186v Reproduced from the manuscript's facsimile edition (see above, note 4)

It is a worthwhile exercise to reconstruct the stages of decoration and illumination of multi-layered manuscripts, since each textual layer may have been decorated immediately after it was written, prior to the copying of an additional layer, which was also decorated and illuminated, as can deduced from inspection of the French Miscellany.[6]

An issue that is undoubtedly of great interest is uncovering the relationship of the illustrations – of which the liturgical manuscripts provide remarkable examples – to the text; however this important issue would require an iconographic investigation which is beyond the scope of a codicological analysis.[7]

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[6] See Beit-Arié, 'The Making of the Miscellany' (above, note 4), pp. 65-59.

[7] See, e.g., G. Sed-Rajna, 'The Image in the Text: Methodological Aspects of the Analysis of Illustrations and their Relation to the Text', *Bulletin of the John Rylands University Library of Manchester*, 75/3 (1993), pp. 25–31 & Figures 1–14.

Chapter 10: Bibliographical, codicological and palaeographical units: unitary, homogeneous, composite, merged, and patchwork codices

When using medieval manuscripts, one must be aware of the 'archaeology' of their formation and examine the strata comprising them and how they interrelate. The existence of several texts, and even of a single continuous text within a single codex provides no guarantee that they were produced together at the same time and place or by the same scribe, and that the date of the copying appearing in the colophon applies to the entire codex. A codex might be completely uniform (except for additions, miscellaneous notes and records written by later owners, who often would use the empty pages in the original manuscripts for their own writing). But it also might include a number of manuscripts that were written independently in several regions (or within the same region) or in several time periods but were bound together in the interests of economy, or to better protect manuscripts composed of a small number of folios, or for typological reasons having to do with connections between works, their genres, or subject matter. There are some codices in which the text was assembled from parts originating in one or more other copies, which had been separately produced and then recombined by anonymous owners. In many more codices there were parts missing – especially at the beginning or end of the work but also in the middle, and sometimes within each of its segments – which at some later point were filled in and completed. Distinguishing between these characteristics of codices is of essential importance for identifying their provenance and estimating the dates of the texts, and for the critical study of the text by its editors and users. In the next pages we shall present a few terms that will help us categorise the codices according to their composition and stratification and by describing their distinguishing traits.[1]

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[1] This issue has been addressed recently within Latin and Greek codicology, and especially in respect to codices of the composite miscellany type: See the proceedings of the international conference devoted to this particular type: *Il codice miscellaneo: Tipologie e funzioni – Atti del Convegno internazionale, Cassino, 14–17 maggio 2003*, ed. E. Crisci & O. Pecere, special issue, *Segno e testo*, 2 (2004). In his article 'Codicological Units' (*ibid*. pp. 17-42), Peter Gumbert surveys the methods of classification that have been proposed, and systematically presents his own suggested distinctions and terminology (including a list of terms and definition on pp. 40-42), some of which I agree with, some with which I take issue, or to which I assign different meanings in the classification proposed below, see Gumbert's review of the previous literature in his above article. See also J.P. Gumbert, 'A "Codicological Unit"', *Quarendo*, 33 (2003), pp. 5–11 and B. Munk Olsen, 'L'élément codicologique' in Hoffman (ed.), *Codicologie comparée*, pp. 105-129. Munk Olsen defines the codicological unit as the smallest element

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In examining a codex, no matter what its composition, one must first distinguish between three foundational strata: the **bibliographical unit**, the **codicoligical unit**, and the **palaeographical unit**. The codex we see with it library call mark constitutes a bibliographical unit, regardless of whether it was composed of several manuscripts. A codicological unit is the production unit of the manuscript – the part or parts that were produced in a single time and place. A bibliographical unit may include several codicological units. A palaeographical unit is a sub-unit of the codicological unit – each part (or parts) of it that was written in a different hand, and this term also applies to manuscripts that were copied jointly by several scribes, although not necessarily simultaneously.

The uniforem codex

A unitary codex is a manuscript that is written by a single hand and in which there is an overlap of all three units: bibliographical, codicological, and palaeographical. Still, it should be emphasised that even within a unitary codicological unit one can distinguish among production units. A change to the composition of the quires at the ends of textual units (such as a smaller quire or a larger quire at the end of some parts

having an independent existence, and in which the end of the text overlaps with the end of the quire. Muzerelle (*Vocabulaire codicologique*, section 143.04) defined the codicological unit as a volume or part of a volume whose production can be viewed as a single action undertaken within the identical circumstances of time, place, and technique. This definition approaches our own. Cf. the article by Patrick Andrist devoted to the methodology of describing complex manuscripts, and especially its implementation, P. Andrist, 'La descrizione scientifica dei manoscritti complessi: fra teoria e pratica', *Segno e Testo*, 4 (2006), pp. 299–356. Andrist indeed took care to separate the components of complex manuscripts in the collection of Greek manuscripts kept in Bern's municipal library and clearly described their components in the catalogue he published: P. Andrist, *Les manuscrits grecs conservés à la Bibliothèque de la Bourgoisie de Berne – Burgerbibliothek Bern: Catalogue et histoire de la collection*, Diekton–Zurich 2007. He also published the rules of the catalogue in a separate (undated) booklet: Idem, *Les manuscrits grecs conservés à la Bibliothèque de la Bourgoisie de Berne – Burgerbibliothek Bern: Règles de catalogage*, Version 3.0, and now on CD, Zurich 2007. Recently an entire book has been devoted to complex codices, in which terminology has been proposed for the many components of manuscripts and examples are presented for the implementation of the terminology in the description of Greek codices. See P. Andrist, P. Canart & M. Maniaci, *La syntaxe du codex: Essai de codicologie structurale* (Bibliologia 34), Turnhout 2013. Cf. the articles recently collected in: *One-Volume Libraries: Composite and Multiple-Text Manuscripts*, ed. M. Friedrich & C. Schwarke (Studies in Manuscript Culture 9), Berlin–Boston 2016. The relatively large number of codicological components in complex codices have been clearly documented also in Richler and Beit-Arié catalogue of Hebrew manuscripts in the Vatican Library and even before that in the Richler and Beit-Arié's catalogue of the Palatina library in Parma. They were noted in a more concise manner in the Neubauer and Beit-Arié Catalogue of the Bodleian Library in Oxford.

of the Bible or a change in the layout of the copying in a manuscript written in a single hand may be evidence of a distinct phase in the production of the unitary codex.[2]

Homogeneous codex

A homogeneous codex is a manuscript whose production was unitary, but in which the copying was divided among several scribes who worked in parallel, as evidenced by differences among the scripts and para-scriptural elements, despite the employment of a stereotypical script type characteristic of medieval scribal culture. Only rarely did the scribe who wrote the colophon mention the involvement of another scribe in the copying.[3] In chapter 1, section 5, it was noted that despite the absence of institutional or commercial copying centres or ateliers within Jewish societies, a considerable number of the dated manuscripts – 9 percent until 1500 and slightly less until 1540 –

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[2] See, e.g., an attempt to uncover the stages of copying and the production units by examining the quire structure in correlation with the textual units in the French Miscellany from the end of the thirteenth century, in my article in the companion volume to the facsimile edition of the Miscellany, M. Beit-Arié, 'The Making of the Miscellany', in *The North French Hebrew Miscellany (British Library Add. MS 11639) – Companion Volume to an Illuminated Manuscript from the Thirteenth Century France in Facsimile*, ed. J. Schonfield, London 2003, pp. 48–59.

[3] An example of a mention of a co-copyist in a colophon is found in MS Paris Hébreu 750 (*Manuscrits médiévaux*, II, 69), which was written in Italy in 1428, and in which a grandfather notes the part of his grandson in the copying: יה׳ יקבץ נפוצותינו וירחם על שאריתנו ונזכה לראות בבית משיחנו במהרה בימינו אמן נכתב משלי שועלים ע״י חביב חיים נכדי יי״ו וקצת מאלכסנדרוס על ידו גם כן והמותר מאליסנדרי נשלם ע״י הצע׳ יהוסף קתב יזיי״י תלמיד מן הסופרים בכאמ״ר דניאל זלה״ה ממשפחת המיונק׳ה׳ יקבץ נפוצותינו וירחם על שאריתנו ונזכה לראות בבית משיחנו במהרה בימינו אמן נכתב משלי שועלים ע״י חביב חיים נכדי יי״ו וקצת מאלכסנדרוס על ידו גם כן והמותר מאליסנדרי נשלם ע״י הצע׳ יהוסף קתב יזיי״י תלמיד מן הסופרים בכאמ״ר דניאל זלה״ה ממשפחת המיונקי יצ״יא בחודש אלול לפרט קפ״ח י יצ״יא בחודש אלול לפרט קפ״ח (fol. 79v. The manuscript's foliation is 80-90, 24-79), and indeed it was observably written by two hands, the change occurring on fol. 38v in the middle of the line: the grandson copied fols. 80r-90v, 24r-38v (the middle of line 8), and the grandfather copied fols. 38v (the the middle of line 8) -79v. Sometimes in multi-handed manuscripts the scribe who wrote the colophon noted only the scope of his individual copying, e.g. in MS Jerusalem Heb. 8° 1052, which was written in Istanbul, in 1459 by three copyists (*Manuscrits médiévaux*, III, 110). The third copyist wrote a colophon in which he noted having written some 25 folios (וכתבתי ממנו שיעור כ״ה ניירים) and indeed his handwriting is observable in approximately this number of folios (fols. 209-235). An interesting example in which the participation of two vocalisers is mentioned is found in MS London Add. 19776 (Margoliouth Catalogue 80), a codex produced in Germany in 1395 containing the Pentateuch, the Five Scrolls, and the Haftarot. In a poem written by the commissioner of the manuscript, he mentioned the biblical manuscript's two vocalisers, specifying each one's part, as well as the name of the copyist, each of which worked in a different location: חזק ונתחזק הסופר. ואל יוזק בעל הספר. ובעל המלאכה יזכה לביאת גואל. והנקדנים יתברכו מאת צוריאל. זה ספר חומש עברי וחמש מגילות והפטרות וספר דיקדוק הקריאה ועין הקורא כתב ר׳ שמחה ב״ר שמואל הלוי וגמר בעיר קובורק <Coburg> ור׳ שמואל ב״ר אברהם נקד ה׳ חומשים בעיר בבנבערק <Bamberg> ור׳ גרשם ב״ר יהודה נקד חמש מגילות והפטרות וספר הדיקדוק ועין הקורא בכפר רוטלזי <Roedelsee>. והכל נשלם ונגמר בעזרת מגן ישראל ביום א׳ בראש חדש כסליו שנת חמשת אלפים ומאה וחמשים ושש שנים לפרט <...>. ושלי זה הספר מאיר ב״ר עובדיה המכונה הצעיר ליברטרוט ושמי ושמות יגיעי המלאכה הסופר והנקדנים רמזתי וכללתי בשיר משקלי (fol. 252r).

were written by multiple hands. The distribution of this phenomenon is not uniform. The proportion of multi-handed manuscripts in Germany, France[4] and Byzantium[5] is slightly greater than that in Italy and in the Middle East.[6] The number of hands usually amounts to no more than two or three, but at times this number is surpassed.[7] Copyists were not necessarily allocated equal parts in the copying. At times one can identify hands that are responsible for only a small part or parts of a manuscripts, and at times it is apparent the majority of the manuscript was copied by the main scribe; this suggest that the other participants in the copying were none other than the scribe's own family or disciples.[8] In some multi-handed copies the copying was allocated among the main hands participating in the book's production according to quires;[9] in other words, the

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[4] Twelve percent of all dated manuscripts before 1500 were produced in Ashkenaz; fourteen percent of them in the fourteenth century, despite the view that multi-handed manuscripts were less valuable than homogeneous ones, an opinion explicitly stated in a responsum by the thirteenth century R. Meir ben Baruch of Rothenburg (see above, chapter 1, note 160, and compare there this opinion with the emphatic statement of the copyist of MS Amsterdam Ets Hayyim Library A 1-2 that the manuscript was written in a single hand.

[5] Their percentage there is greater than that in Ashkenaz – fourteen percent. In the fourteenth century more than one fifth of Byzantine manuscripts were multi-handed.

[6] Eight percent. Nine percent in Spain. In the Orient (including Yemen) – six percent.

[7] An example of a copying in which more than three hands participated is MS Oxford MS. Hunt. 200 (Neubauer Catalogue 416, cf. the Beit-Arié Catalogue under the same number). The manuscript was copied in 1279, perhaps in Iraq, by seven copyists (after adjusting by the reduction of several writing variants that share the same codicological traits in one vicinity). This is an example of a rare multi-handed shared copying, which would appear to attest to the existence of a kind of Jewish scriptorium: the copying was allocated among the copyists according to quires – in some cases a copyist copied a single quire or a group of quires, and in other cases, pairs of copyists copied a single quire or a group of quires. See M. Beit- Arié, 'MS Oxford MS. Hunt. 200,' *Kiryat Sefer*, 53 (1977/8), pp. 365-367 (in Hebrew).

[8] This is the case in respect to MS Oxford, mentioned in the preceding note, in which most of the copyists copied only a few pages and only the scribe of the colophon had written a significant portion of the manuscript. The same is evident in many manuscripts, e.g. MS London, Harley 5648 (Margaliouth Catalogue 518), which was written in Ashkenaz in 1253/4 by seven copyists, of which only two copied large portions of the manuscript, while the other five copied only small sections. Cf. my remark, above, chapter 1, in the text between the note identifiers numbered 160 and 161.

[9] See e.g. *Manuscrits médiévaux*, II, 22. This manuscript was apparently written in northern Italy in 1334, by seven scribes. Each scribe (except for one hand which copied only a single page) copied his parts in separate quires, apart from the copyist who wrote the colophon, who had twice replaced one of the copyists, each time in the middle of the quire, and completed the copying of both these quires until their ends. In the process of completing the first quire he continued to copy another two entire quires. This copyist employed a typical Italian writing. This manuscript also affords an example of the commissioning of a copying at the hands of professional Ashkenazic scribes, with the Italian owner participating in part of the copying, as well as an example of a colophon being written by the owner who had copied a small portion of the manuscript. Although the owner did not state in the colophon, which is formulated in the singular, that he was copying for his own use, this can be inferred from the wording of the colophon. Based on the many annotations and addenda written in his hand throughout the manuscript's margins, it is apparent that he hired the Ashkenazic scribes to copy most of the manuscript.

palaeographic caesuras overlap the structure of the quires, a fact that may also offer clues in regard to the organization of production. One cannot conclude that the text of a manuscript of this kind was copied in simultaneous fashion, by means of allocating to each copyist text sections and the number of quires needed for them (this mode requires close copying from a model and its physical division into quires), unless at the points of transition from one copyist to another one can find signs of the textual layout being merged so as to ensure its continuity, e.g. the over-spacing or over-crowding of words in lines at the end of the quire or an increase or reduction of the number of lines in a page at the same location.

Distinguishing among the hands that shared in the copying of the text is of interest not only to the codicologist and the historian of book production, but must also be of concern to the textual scholar, for the possibility cannot be ruled out that copyists who were copying substantial sections of the text in entire quires were at work simultaneously and therefore must have used of different models.[10] Furthermore, each copyist undoubtedly had his own orthographic habits and linguistic traditions, and the particular influences of the copying mechanism on his own copying, as well as his own knowledge, which must certainly have left a mark on his own transmission of the text; therefore, to regard a manuscript as a monolithic whole would be marred by eclecticism. The separation of hands may be easy to accomplish when the copyists employed idiosyncratic handwritings that are visibly distinguishable, but may be exceedingly difficult when they employed the stereotypical scripts of their region. The uniformity of the script types through their development is especially conspicuous in the Franco-Germanic zones, as well as in the Spanish, Italian, and Byzantine zones. It is not in evidence in the Orient, where the manuscripts exhibit a great variety of scripts styles, with the exception on the early biblical codices which are written in a decorative square

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[10] This is the conclusion suggested, for example, from inspecting the text-version of *Bereshit Rabba* in MS Vatican, Vat. ebr. 30, which was undertaken by Michael Sokoloff. See M. Sokoloff, 'Ha-'ivrit shel *Bereshit Rabba* le-fi MS Vatican 30', *Lešonenu*, 33 (1968/9), pp. 36-42. *Idem*, 'Mavo,' in: *Midrash Bereshit Rabba, MS Vatican Vat. ebr 30* [facsimile edition], Jerusalem 1971, p. [3]. Sokoloff deduced, based on linguistic criteria (orthography) that the first and third scribes, according to M.D. Cassuto's division in his catalogue of Hebrew manuscripts in the Vatican library), had copied from a single source, while the second scribe had copied from a different, later source, which had already been influenced to some degree by the Babylonian Talmud's orthography. According to the separation of hands that I performed (see the Richler & Beit- Arié Catalogue under this number), the first and third scribes according to Cassuto's abovementioned division were in reality the same individual.

style. The square and semi-cursive scripts reveal a great deal of uniformity, which is witnessed less in the cursive scripts.[11]

The stereotyped nature of the writing which one often observes in Hebrew manuscripts is the product of a cultural ideal and pedagogical convention, as articulated by Yehuda Ibn Tibbon (Spain, circa 1120 – Provence, circa 1190), the patriarch of the family of translators, in the ethical will he left to his son Shmuel. In it he adamantly states that a disciple is required to emulate the writing of his master until the forms of their writing become indistinguishable, and that forms of writing, even if unfamiliar to the writer, may be assimilated through observation and imitation::

וגם על הכתב העברי לא השגחת כראוי <...> והלא ראית בנו של ר׳ ששת והוא בן י״ב שנים, כתיבתו דומה לכתיבת רבו ר׳ פטור וכאילו היא היא בעצמה, כי הכתיבה היא צורה מן הצורות ובעיון ובהתבוננות יוכל אדם לחקותה ובהרגל.

> Nor hast thou acquired sufficient skill in Hebrew writing <…> Hast thou not seen R. Shesheth's son, a boy of twelve, whose writing so resembles that of his teacher R. Patur, that the scripts are indistinguishable? Handwriting is but an art, and with attention, intelligence, and practice, anyone can imitate his model.[12]

Yehuda Ibn Tibbon supported a similar approach to the study of Arabic writing by citing the example of R. Samuel HaNagid:

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[11] An outstanding example of this can be seen in the autographed writings in Maimonides' own hand, a large number of which have survived. The extant drafts (especially of his opus *Mishne Tora*, but also for his other writings and his epistles) are written in an idiosyncratic cursive Sefardic writing, with letter shapes and ligatures that are characteristic of him alone, while the autographed copies of the commentary to the Mishna in Judeo-Arabic are written in a semi-cursive script in a style similar to the conventionally used script. S. D. Sassoon, in his English introduction to the facsimile edition of the volumes of Maimonides' commentary on the Mishna, collected facsimiles of most of the drafts of his autographed writings that had survived and were known at the time. See *Maimonidis Commentarius in Mischnam e codicibus Hunt, 117 et Pococke 295 in Bibliotheca Bodleiana Oxoniensi servatis et 72-73 Bibliothecae Sassooniensis Letchworth*, vol. I (Corpus Codicum Hebraicorum Medii Aevi), Copenhagen 1956, pp. XX-LXI; S. M. Stern in his introduction to the third volume of this edition, (1966, pp. I-XVIII) added facsimiles of Maimonides' medical writings, his epistles, and prescriptions. Since then additional drafts have been discovered and published. See J. Blau and S. Scheiber (eds.) *An Autograph of Maimonides from the Adler collection and the Leningrad Library*, Jerusalem 1981; and especially S. Hopkins (ed.), *Maimonides's Commentary on Tractate Shabbat: the Draft Commentary according to Autograph Fragments from the Cairo Geniza: Arabic Original and Hebrew Translation*, Jerusalem 2001.

[12] See Abrahams (ed.), *Ethical Wills*, pp. 59-60. For the practice of children imitating their teacher's hand in the process of writing acquisition in Egypt, according to surviving fragments of exercise books from the Geniza, see: J. Olszowy-Schlanger, 'Learning to Read and Write in Mediaeval Egypt: Children's Exercise Books from the Cairo Geniza', *Journal of Semitic Studies*, 48/1 (2003), pp. 59–60, 66. Deserving of mention here is Armando Petrucci's argument about the decisive role of imitation in the process of learning Latin writing in the early Middle Ages. Petrucci points out that the Carolingian Capital writing and the types of miniscule writing emerged through the defining influence of the method of graphic imitation – a legacy from the early Middle Ages. See A. Petrucci, 'Libro, scrittura e scuola', in *La scuola nell'Occidente latino dell'alto medioevo – XIX Settimana di studio sull'alto medioevo, [Spoleto], 15–21 aprile 1971*, Spoleto 1972, vol. 1, pp. 313–337 [= 'Book, Handwriting, and School', in idem, *Writers and Readers in Medieval Italy – Studies in the History of Written Culture*, trans. and ed. C.M. Radding, New Haven 1995, pp. 61–76].

בחר לך מספריך הערביים ספר אחד שתהיה כתיבתו נאה בעיניך, והשתדל לדמותה
ולחקותה, כי הנשיא ר׳ שמואל לא למדהו אדם כתיבת הערבי אך לקח כתב אחד מכתבי
הסופרים החשובים והשתדל לכתוב כדמותו, וטרח עד שעלה בידו.

> Select from among thy Arabic books whose script pleases thee. Strive to imitate
> it. For in the instance of R. Samuel HaNagid, no one taught him to write Arabic.
> But he took a manuscript written by a scribe of repute and strove to copy it. He
> persevered until he succeeded in equalling his.[13]

Distinguishing between hands that shared in the copying of the text in a single codex

Inspection of multi-handed manuscripts in which the boundaries of each hand's copying
are easily discerned reveals the individual features of the auxiliary components in the
writing of copyists who employed a single type of writing conventionally used in that
region. These components are not related to the script itself but to methods of preserving
the order of the codex, stratagems for keeping the left vertical boundary margins, and
para-scriptural and peri-textual marking signs that accompany the writing. The para-
scriptural signs were adopted by the copyist according to his tendencies and personal
habits from among a larger selection of forms characteristic of the writing tradition of
his cultural milieu, and his use of them persisted even with the passage of time and
through changes of script modes and types and varieties. Copyists were consequently
likely to employ the same signs when using different modes of writing (the square and
semi-cursive) within a single copying or for the copying of different codices and when
the script itself was either very uniform, or the opposite, various in its forms. Due to their
individuality, the personal features of these components are quite easily recognised even
in multi-handed manuscripts written in stereotypical scripts, and because of their
stability, they offer a more convenient means for separating hands than by comparing
script variants and attempting to isolate the hands based on the elusive and ever-
diversifying writing – a common phenomenon and a bewildering one to anyone who has

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[13] See Abrahams (ed.), *Ethical Wills*, p. 84. On the individual quality of writing in the Arabic script,
according to Ibn Qayyim al-Jawziyah, (d. 1350), see F. Rosenthal, 'Significant Uses of Arabic Writing',
Ars Orientalis, 4 (1961), p. 23.

tried to locate copyists only on the basis of their writing.[14] The individual elements of the components that accompany the writing are therefore a useful aide for isolating hands, whether in multi-hand codices or in separate codices written with several variations of the writing or several script types, or which were written in a style so uniform as to make it very difficult to separate the hands. Moreover, these individual features enable one to locate different parts that had been detached from a single codex as well as identify and join fragments from codices that are dispersed throughout separate collections, especially the hundred thousand of literary Geniza fragments.

These individual features are manifest in the means that the copyist employed during production to maintain the sequence of the copying units, to create a uniform and regular copying, and to fashion a readable and transparent text. Users of manuscripts would do well to examine, document and compare the occurrence of these elements.[15] The following sections detail those means whose implementation bears or are likely to bear an individual stamp, accompanied by a few examples.

Means for maintaining the sequence of the codex, their placement, and decorations

Chapter 5, above, detailed the ways of marking the sequence of quires, bifolia, and folios intended to maintain the order of the codex. We observed there how several types of means of maintaining the sequence might have been in use within the same region

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[14] Colette Sirat (*Hebrew Manuscripts*, pp. 204-207), in discussing the difficulty of distinguishing between different hands, quotes in abridged manner a passage from Baḥya Ibn Paquda's *Sefer Ḥovot ha-Levavot* (in M. Haymson's translation) in which this difficulty is invoked as an analogy to illustrate the uniqueness of the Creator. Nevertheless, the language of the unabridged passage suggests that Baḥya did recognise the possibility of distinguishing between hands, when the change of hands reveals noticeably different characteristics, as stated in the following section in Yehuda Ibn Tibbon's translation:

<...> כי בעת שנראה כתב שווה בחבורו וצורות המכתב אשר נכתב בו צורה אחת, יעלה בדעתנו מיד כי כותב אחד כתבו <...> ואף על פי כן שאפשר שיכתבנו יותר מאחד, אין ראוי להעלות על דעתנו כן אלא בראיה שתעיד על ברור הדבר: מהתחלף צורת המכתב במקצתו והדומה לזה. ואם היה הדבר כן ולא היה אפשר לראות את הכותב מפני שכתב לפני או אחרי זאת <...> וידענו ידיעה ברורה, כי כותב אחד נמצא יודע מכתב ויכול לכתב כתבו, ולא השתתף בו עמו זולתו מפני סדור חבורו והשואתו <כלומר שוויונו>, מפני שמעשה שני עושים מתחלף ואיננו שוה ומסֻדר על ערך אחד ומשתנה בתקונו ותכונתו. וכן נאמר בבורא יתעלה <...>.(A. Tsifroni edition, [Otsar ha-maḥshava shel ha-Yahadut], Tel Aviv 1964, Section 1, chapter 7, pp. 126-127).

[15] For examples of the personal elements of the auxiliary components of the writing, and the plates showing their distribution of multi-handed manuscripts, see M. Beit-Arié, 'Stereotypes and Individuality in Medieval Handwritings,' *Alei Sefer* 5 (1978): 54-72 (in Hebrew); M. Beit-Arié, 'Stéréotypies et individualité dans les écritures des copistes hébraïques du Moyen Age', *L'écriture: Le cerveau, l'œil et la main – Actes du colloque international du Centre National de la Recherche Scientifique, Paris, Collège de France, le 2, 3 et 4 mai 1988*, ed. C. Sirat, J. Irigoin & E. Poulle, Turnhout 1990 (Bibliologia 10), pp. 201–219; Beit-Arié, *Makings*, pp. 77-92.

and time period, even if one of those means was more popular than the other. The examination of multi-handed manuscripts reveals that a different hand may at times implement a different means derived from a repertoire of conventionally means used for manuscript production in that era. However, even in most cases in which all the copyists of a single manuscript employ identical means, they will sometimes exhibit differences as to its placement (e.g. whether catchwords are inscribed in their usual place to the right of the left margin line in the lower margin, or in the middle of that margin) or its decorative aspect, especially the simple decorative flourishes that copyists tended to add to catchwords, and which frequently display variety even when all the copyists of a particular manuscript share the same method for catchwords and used a uniform placement.
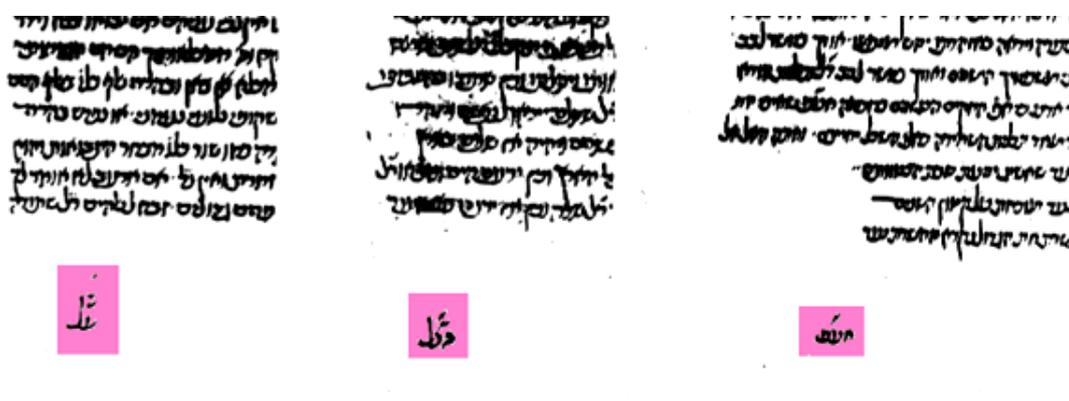
Shown below is an example from MS Oxford, MS. Opp. 213, which was copied in Fromista in northern Spain in 1480/1. The three copyists copied the manuscript in a semi-cursive Sefardic script of the same style, which renders them almost indistinguishable upon first glance. The decorative flourishes used for the catchwords are of the same type, but each copyist uses his own version of the decorative element.

Stratagems for preserving the left margin line

The diverse stratagems for lines alignment, detailed above in chapter 7, serve as an excellent source that enables us to distinguish among copyists of multi-handed manuscripts and to accurately demarcate the boundaries of their copying. Indeed, some stratagems are characteristic of one or another area, while others are common to all regions; however, as emphasised in that chapter, within each region a scribe had at his disposal a tradition comprising a fair number of stratagems, a sort of arsenal from which he could select his preferred devices and upon which he could even impress his individual stamp. As argued there, line management was the main avenue through which a scribe could find room for individual expression within the conservative

tradition of book writing and production. An examination of multi-handed manuscripts usually indicates that each of the copyists of a particular manuscript wielded his own combination of justification devices. Even when all the copyists shared the use of the same combinations, the forms of graphic filler they employed remained different, and even when these were derived from the same type, they display at least slight or significant differences. At times the differences among stratagems employed in a multi-handed codex are slight yet systematic, and therefore they allow one to separate the hands. One of the copyists, for example, might use the stratagem of anticipating letters, while another might use the same popular stratagem but without producing stunted letters in bisected words at the ends of lines.

An example of this can be seen in MS Paris Hébreu 319 (R. Isaac Alfasi's *Sefer Ha-halakhot* [aka *Hilkhot HaRif*]) which was copied in 1344 in Italy by seven scribes,[16] one of whom used a semi-cursive Italian script while all the others wrote with a square Ashkenazi script and exhibited a similar style. A comparison of the Ashkenazi hands shows that not one of them used the exact same combination of stratagems as another,

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[16] On this manuscript, see above, note 9.

and that the graphic fillers that only five of the six used have a different appearance in the handwriting of each scribe.

The following are the stratagems chosen by the manuscript's Ashkenazi scribes, as illustrated in the above photograph: עד כאן

Scribe 1: Dilation or contraction of letters; anticipating letters of the first fully written word on the next line, when the last of these letters is *shin* its form is stunted; abbreviating words (lines 4, 7, 11, 13 – the last two completed by the proof-reader); writing exceeding words at a distance in the margins (in the final line). This scribe avoids the use of graphic filler.

Scribe 2: Dilation or contraction of letters; anticipating letters (line 1); graphic filler (line 11); writing exceeding words at a distance in the margins (in the penultimate line).

Scribe 3: No use of dilation or contraction of letters; anticipating letters (lines 1, 15, 18), when the last of these letters is an *alef* or *shin* its form is stunted; use of a graphic filler that is distinct from that used by Scribe 2 (lines 1, 8, 13, 17, 18, 21, 23).

Scribe 4: Dilation or contraction of letters in a very conspicuous manner; anticipation of letters (line 12), when the last letter is an *alef* its form is stunted; use of a graphic filler that is distinct from those of Scribes 2 and 3 (the graphic filler is not illustrated in the photographed sample).

Scribe 5: Dilation or contraction of letters; use of a graphic filler that is distinct from those of Scribes 2—4, although of the same type (the filler is not illustrated in the photograph); no anticipation of letters, unlike the other scribes.

Scribe 6: Dilation or contraction of letters; anticipation of letters without stunting (lines 1, 2, 4 and elsewhere); use of a graphic filler that is distinct from those of the other scribes, although of the same type (lines 16, 19); writing exceeding letters at a distance from the margins (line 9, the photograph is cropped and therefore the use of this stratagem is not visible).

Of all the line management devices, graphic filler may be the most convenient and recognizable means for distinguishing hands. Two prestigious scribes immigrated to Italy and were active there during the fifteenth century – the scribe and painter Yo'el ben Shime'on of Germany, who wrote in a square Ashkenazic script even when working in Italy, and the prolific scribe and author Avraham Farissol of Provence, who used a square and semi-cursive Sefardic script, but also adopted the semi-cursive Italian script when copying books commissioned by Italian owners, especially when he was completing manuscripts written in a semi-cursive Italian script. Both scribes adopted personal graphic fillers, which allows their writing to be easily identified even in uncolophoned manuscripts. Yo'el's filler is simply a typical Ashkenazi filler, but he added a thin stroke at the bottom which is unique to him.[17]
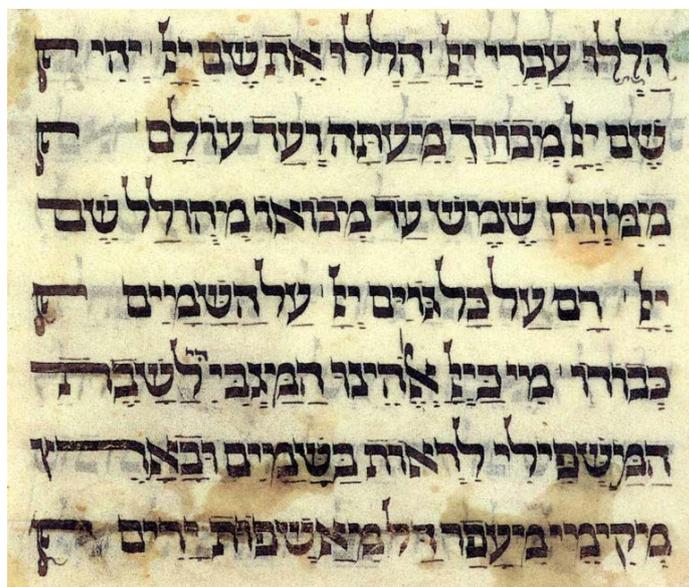
Portion of a Haggada written by Yo'el ben Shime'on in 1478, MS Washington, Library of Congress, fol. 17v, facsimile (see chapter 1, note 153)
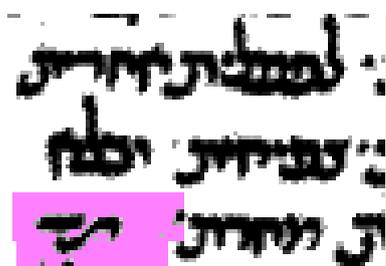
Abraham Farissol used a unique filler which became a 'trademark' of sorts, although a few of his disciples seem to have adopted it as well. It is striking that Farissol incorporated his idiosyncratic filler not only in his Sefardic square writing, as he did in his semi-cursive writing, but also when he used a semi-cursive Italian script.[18]

Substitutes for the Tetragrammaton

As is well known, the substitutions used for writing the Tetragrammaton in non-Biblical manuscripts since the time of the Judean Desert Scrolls include many and diverse forms. Most of these substitutions are based on two components: the letter *yod* – usually two or three *yod*, in Oriental manuscripts a sequence of *yod-vav-yod* – along with basic

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[17] For details and illustrations in numerous plates, see *Makings*, pp. 227-233, 247-248.

[18] See the examples, *ibid*. pp. 91-92. A similar graphic filler was employed in a manuscript written in Bukhara in 1488 (*Manuscrits médiévaux*, III, 42). While it usually it exhibits a patition in the form of a stunted *mem* (see *ibid*. Plate 42b), on occasion, when the filler is written without a patition one notices a great similarity to Farissol's distinctive filler.

graphic element (such as a supralinear dot) or a decorative element which sometimes dangled all the way to the base of the letters. The differences between the substitutes are most visible in these graphic elements, although one can recognise in them the basic forms that were characteristic of the local writing traditions. Nonetheless, these forms bear an individual stamp even when the copyists employed the same elementary forms. Differences in the rendering of forms of the Tetragrammaton substitutions are detected with ease, similar to the ease with which one can distinguish different types of graphic filler.

Presented below for the purpose of illustration is MS Munich Cod. Hebr. 5, which was copied in 1232/4 in Germany by two scribes whose writing is uncannily similar.[19] The two first columns in the lower part of fol. 120v in volume 2, shown here, were written by one scribe, whereas the third column was written by another. The different way in which Tetragrammaton substitutes were written by each are easy to notice

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[19] See above, chapter 2, Appendix: 'A scribal stratagem for disclosing the copyist's name by the copied text and multi-handed manuscripts.'

In addition to the idiosyncratic forms for writing substitutions for the Tetragrammaton, one should also inspect the writing of the combined form of the abbreviated joint *alef-lamed* used for the name *Elohim* (see the photograph above, column 1, at the beginning of line 11), in names (such as ישראל), and in regular words in most manuscripts (usually in non-square scripts) in all zones. These abbreviated forms, in which the *lame'*s neck attaches to the top of the *alef*, whose left leg has been truncated, also appear to be quite varied and individual in form.

**Graphic markings improving the text's legibility and transparency**

The letters of the script transmit the content of the text alone, but to make the text accessible to the reader, the copyist is required to improve its legibility and emphasise its hierarchical structure. To this end he employs graphic aides that accompany the text and the writing, most of which have been reviewed above in chapter 8. The following are a few of the functions of these graphic aids, the marking of pauses; abbreviation of words and acronyms; emphasis of words, sentences, titles, book endings; differentiation of terms; marking roots; names of letters; loanwords from foreign languages, numbers, lemmata, quotations, as well as proofreading markings. The graphic aides,
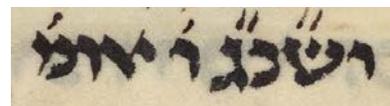
especially those used to emphasise words, titles, headings and end of manuscripts or parts of the text, are diverse, and a in a few of them it is possible to discern regional types. Inspection of multi-handed manuscripts shows that these graphic aides too bear an individual stamp.
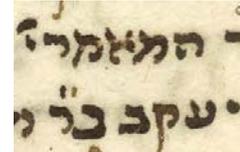
The photograph below shows a page from MS Oxford, MS Mich. 626, a copy of the *Mishne Tora* with *Hagahot maimoniyot* which was written in Germany in 1409 by two scribes employing a square script, one of whom replaced the other in the course of the copying (fol. 123v). The first copyist wrote the first nineteen lines, and the second began on the twentieth line, but also wrote the heading <הגה>ה on the previous line. The difference between the upper marking of the title הגה in the handwriting of the first copyist (lines 8, 11) and in that of the second copyist (lines 19, 22, 25, 34) is clearly
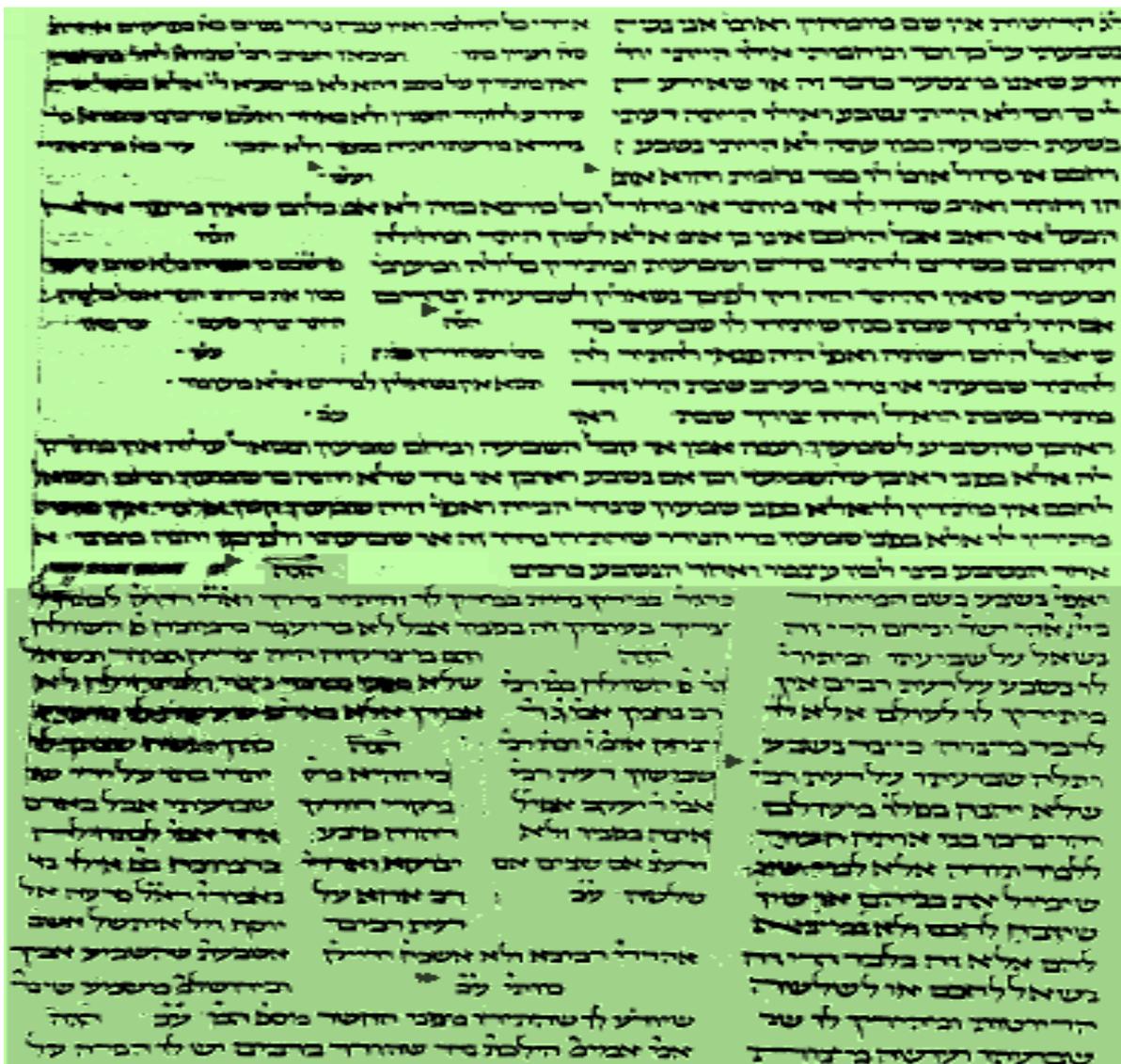
visible: the former marks them with a thin horizontal line over the letters, while the latter uses a thick arched line.

Now, in this manuscript three pages were written in a semi-cursive Ashkenazic script in the Gothic style characteristic of that age (fols. 158r-159r). How might we determine whether those pages were written by one of two the scribes who copied the rest of the manuscript in a square script? And, assuming they were, how can we know which of the two scribes it was? Indeed, if we inspect the markings of the abbreviations (e.g. on fol. 158v, presented below in line 1 of the first column and in line 4 of the second column), the acronyms (e.g. on the same folio, line 3 of the first column) as well as the markings made for emphasis (ibid. second column, end of line 27), we shall see that these markings are identical to those of the second scribe. We are therefore justified in assuming that these pages, which were written in a different script type, were written by the second scribe, who employed the same idiosyncratic graphic markings that accompany his writing in the other script type as well.

Because of the individual characteristics found in the auxiliary graphic elements, they provide a tool for identifying the hand of the copyist, as the above example demonstrates. Therefore, in any attempt to distinguish between hands one should rely for assistance on an inspection and comparison of these elements. Whenever it is suspected that a manuscript was written by several copyists, one must isolate these elements within each variation of the writing. If the changes in these elements coincide with changes in the writing, this indicates that each of the sections that is written in a different variation of the writing was copied by a different hand. However, if despite the variations in the forms of writing, or even a change in the mode of script (square, semi-cursive, cursive), there are no visible differences in the auxiliary graphic elements, it should be assumed that that we are dealing with a manuscript that was copied by a single copyist. The copyist in question might have varied his writing styles for a number of reasons – switching to pens with differently cut nibs, singling out certain textual passages by changing the style and mode of the writing, lengthy breaks interrupting the copying process – but he would adhere to his personal habits when using auxiliary markings.

The examination of manuscripts by copyists whose output survives in many manuscripts written over a period spanning many years, such as Yo'el ben Shime`on (dated manuscripts produced in Germany and Italy in a square Ashkenazic script from

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1449 to 1485) and Avraham Farissol (sixty manuscripts produced in Italy in square and semi-cursive Sefardic script, and a few in an Italian semi-cursive script between 1469 and 1528) proves that most of these individual elements are uniform and stable. This being the case, their diagnostic potential is valuable not only for differentiating among several hands that coincided in the making of a book, but also for identifying and joining fragments of a single codex and for identifying manuscripts by a single copyist which were copied over long time periods, in several modes as well as types of scripts. The practical conclusion that may be drawn from examining the graphic elements auxiliary to the writing is to recognise their importance as a touchstone when attempting to identify folios, bifolia, and quires of the same codex, alongside other accepted means of determination, including the forms of writing, which may be misleading, and basic material aspects such as the writing material and its size, the dimensions of the written area and the number of lines in the page. Taking these components into account is crucial particularly for the increasing number of studies and bibliographical records of hundreds of thousands of Hebrew fragments, most of which derive from the great Cairo Geniza which for centuries had accumulated textual remains within the Ben Ezra synagogue in Fusṭāṭ. In the late nineteenth century, the crypt was emptied out and the texts found their way into countless libraries, chief among them being the University Library in Cambridge. The auxiliary graphic components are extremely useful for validating the fragment matches produced by an automated process that has been developed, and is still evolving, thanks to the initiative of the Friedberg Genizah Project.[20]

The composite codex

A composite codex is a manuscript that contains several codicological units that were independently produced in different places and different times (but sometimes also within the same region during the same approximate time period), but which in the course of time, at some point in their journey, were bound together at the initiative of one of their owners due to considerations of maintenance or usability. Many manuscripts of this kind have the appearance of being a consistent whole, because they assemble together copies of works of a single genre, such as Kabbalistic or philosophical texts, commentaries on biblical books, or medical treaties, but many

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[20] See above, chapter 1, note 76.

others bind together works from altogether different domains in an artificial manner. Obviously, when describing composite codices or using them, their various units must be strictly separated – each codicological unit unto itself. This separation is based on the codicological characteristics of each unit as well as the types of script they employ and the dating of their writing. The foremost criterion for separation is the writing material. In a manuscript of this kind, it is obvious that a part written on parchment does not belong together with a part that was written on paper. Within the parts that were written on paper, the watermarks embedded in the bifolia must be inspected to see whether or not they are similar. The modes of quiring are also useful for differentiating between codicological units. A transition from one autonomous unit to another quite evidently cannot take place within the same quire. Likewise useful for the separation of units is the identification of the ruling techniques and their regional or chronological characteristics, and even the comparison of the texts' layouts.

A compound Codex

A compound codex is a manuscript of a particular work that was constructed out of several fragmented copies – usually from the same region – which were merged together. The transitions between one copying and the next are discontinuous and may contain overlaps or lacunae. The phenomenon is clearly evidenced in the Orient and in Ashkenaz.

A patched codex

A patched codex is a manuscript in which only a part of the original has survived and whose missing parts have been completed. Usually, the parts missing are the beginnings or the ends – these being the most vulnerable parts of a manuscript – but sometimes also the middle parts. Manuscripts with larger or smaller missing parts are a common sight, and in many such manuscripts the missing text was eventually completed by one of their owners. These complements may be written in a script of a type that differs from the surviving sections of the original manuscript, and in these cases, they will be readily observable to the eye. However, such patches were frequently added in the same region where the original manuscript was written, and the use of the same script type can misguide the user of the manuscript into thinking it a homogeneous codex that was copied by multiple hands. Determining whether the manuscript in question is

homogeneous, i.e. was produced in a single place and time, or a patched one, produced by several copyists who did not share the same textual tradition in divergent times and places, is of more vital importance for text criticism than is the distinguishing between several hands that worked in concert.

The means for distinguishing between a homogeneous codex and a patched codex are identical to the codicological means described above that enable one to distinguish between strata of a composite codex. In addition to these, a complement can be easily discerned when it completes the sections missing from the beginning or the middle of the original manuscript. These complements invariably show signs of the suture at the cut between the end of the completing text and the beginning of the completed text, since the scribe preparing the complementary section cannot calculate or anticipate exactly how many folios are needed or the precise form of the layout that will be necessary in order to achieve a 'seamless' join. As a result, at these transitions – especially on the last page of the complement but sometime also in the preceding pages – we find deviations from the standard outline of the copying, such as crowding of the text (when there is insufficient space to complete it), or, conversely, increased spacing of the text (when the completing text ended before the bottom of the last page) or narrowing of the copying lines and even rendition of the text as geometrical shapes that afford greater flexibility of the layout and its adaptation to the beginning of the original text. These signs of suturing are unmistakable and easily spotted. It goes without saying that no such signs of patching exist at the beginning of the sections that complete the text at its starting point, but they are similarly absent at the beginning of the sections that complete it in the middle or the end, since such completions continue the sequence of the manuscript at the point at which it was cut off.

Fragments

This chapter is the fitting place to mention another very common type of autonomous codex unit, viz. codicological units that have been detached from their original 'textual tissue', through artificial means, and in many instances were dispersed and found their way into various collections. The phenomenon is known also in non-Hebrew manuscripts, but appears to be more common in the history of Hebrew manuscripts

because of the practice of removing to a repository (*geniza*) any books written in a Hebrew script that had become damaged or worn with use.

Among the many fragments surviving from medieval Hebrew codices two main classes should be distinguished. The first, and the most important class, includes fragments of folios, bifolia or quires of codices that had become worn with use and that in accordance with the Jewish tradition that developed during the Middle Ages, especially in the Orient but in the Occident as well, were not abandoned or exploited and reused in biding but were rather deposited in a *geniza* (or buried) as is.[21] The most famous of these, of course, is the vast Cairo Geniza, which was preserved in the synagogue of the Palestinian-Jewish Community in Fusṭāṭ (ancient Cairo), until it was evacuated at the end of the nineteenth century.[22] The documents found in the Geniza attest that most of

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[21] See M. Beit-Arié, '*Genizot*: Depositories of Consumed Books as Disposing Procedure in Jewish Society', *Scriptorium*, 50 (1996), pp. 407–414, and *ibid*. also about findings and evidence of Geniza customs in European synagogues; M. Cohen and Y. Stillman, 'The Cairo Geniza and the Custom of Geniza among Oriental Jewry: An Historical and Ethnographical Study,' *Peʿamim* 24 (1985), pp. 3-35 (in Hebrew), in which the authors collected testimonies about the places used as repositories and the attendant customs from Jews originating from Muslim lands. This ethnographic survey presented fascinating data about the scope of the custom in recent generations in several communities in Kurdistan, Afghanistan, Iran, Iraq, Yemen, Egypt, Libya, Tunisia, and Morocco. On the genizas of synagogues collected by Avraham Firkovich in his journeys to Crimea, the Caucasus, Dagestan, Turkey, Iraq, Syria, the Palestine, and Egypt, see M. Beit- Arié, 'Hebrew Manuscript Collections in Leningrad and their Importance to the History of the Hebrew Book,' *Jewish Studies*, 31 (1991), pp. 33-46 (in Hebrew). A fascinating late testimony concerning the custom of temporary genizas in synagogues and study houses in Jerusalem, including the description of a colourful carnivalesque ceremony of emptying the repositories and transferring them to a permanent geniza in the caves on the slope of Mt. Zion in 1877 was published by Avraham Moshe Lunz in an annual that he published:

עוד בבקר השכם ימלא הביהכ״נס <כך> או(ן)שטאמבולי והרחוב הסמוכה לה המון אדם רב. כשתי שעות קודם חצות היום יופיעו גם כל חכמי וזקני העיר <...> והמה יקחו כל אחד ס״ת העומד בכד חרס והיותר טוב אשר בהמה יובל תחת חופת משי <...> והסבלים וההמונים ישאו את השקים הגדולים המלאים בלויי ספרים. התוף הולך ומכה לפניהם ואיזה מההולכים ירקדו ויזמרו מזמורים ופזמונים נאותים וכן ילכו הלוך ונגן <...> עד בואם אל שער ציון ואל הכר הנרחב אשר לפניו ירקדו ויזמרו <...> וגם יעריכו מערכת משחק בחרבות שלופות אלו מול אלו למען הגדיל את פרשת השמחה (*Jerusalem*, I [1881/2], pp. 15-16).

One of the early rare testimonies about the geniza custom, and the first in which this term was used was seems to have been provided by Benjamin Kennicott, the famous Hebraist, scholar of the textual versions of the Bible and recorder of all the Biblical manuscripts he came across in European collections. At the head of one of the Biblical manuscripts he purchased for himself (now kept in the Bodleian Library), he noted that the manuscript had been given to him in 1770 by a clergyman who had purchased it in Tetuan (Morocco) by a boy who was transferring it to a box called a 'geniza' in the synagogue: 'This manuscript was presented to me by the Rev. Mr. Isaac Netto <…>. Mr. Netto bought it, when in Tetuan <…>, of a boy carrying it to a box in the synagogue, called גניזה, where all fragments of holy writings are preserved, lest they should chance to be put improper use.'The manuscript that was spared from the geniza is MS Oxford MS. Kennicott 7 (Neubauer Catalogue 2331) – the Former Prophets division of a Bible written by the scribe Israel ben Yitsḥaq ben Israel in Toledo in 1222.

[22] Most of the fragments are kept today in Cambridge University. See S.C. Reif, *A Jewish Archive in Old Cairo: The History of Cambridge University's Genizah Collection*, Richmond, Surrey 2000. Up-to-date data and estimates about the scope of the Geniza fragments were provided above in chapter 1, note 58.

the remains of manuscripts in it were deposited there between 1000 C.E. and the middle of the thirteenth century.[23] The large scope of the findings from this repository teach us that the custom of preserving worn out books[24] was not due to the holiness of the copied texts, since the findings included not only unsanctified texts, but also utterly secular

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New information about the first discovery of the Fusṭāṭ Geniza and the beginning of the process of emptying it has been presented recently by Rebecca Jefferson in two articles: .J.W. Jefferson, 'A Genizah Secret: The Count d'Hulst and Letters Revealing the Race to Recover the Lost Leaves of the Original Ecclesiasticus', *Journal of the History of Collections*, 21/1 (2009), pp. 125–142; idem, 'The Cairo Genizah Unearthed: The Excavations conducted by the Count d'Hulst on behalf of the Bodleian Library and Their Significance for Genizah History', in *'From a Sacred Source': Genizah Studies in Honour of Professor Stefan C. Reif*, ed. B. Outhwaite & S. Bhayro, Leiden–Boston 2010, pp. 171–200.

[23] Although documents containing dates spanning from the late ninth century until the nineteenth century have been found in the Geniza, only a few of them derive from earlier than the eleventh century. According to Goitein (*Mediterranean Society*, I, p. 18), the documents reflect a chronological expanse reaching from 1002 to 1266, which attests to the time span of most of the literary fragments that were deposited in the synagogue from 1025 onwards, that being the year in which the synagogue was renovated and apparently when the Geniza chamber was founded. On the history of the discovery of the Geniza and the transfer of its treasures to various libraries, see *ibid.*, pp. 1-28, 395-400. See also S. Hopkins, 'The Discovery of the Cairo Geniza', *Bibliophilia Africana*, 4 (1981), pp. 137–178. Studies about the Ben Ezra Synagogue have been collected in the anthology: *Fortification and the Synagogue: The Fortress of Babylon and the Ben Ezra Synagogue*, ed. P. Lambert, London 1994. On the contribution of the Cairo Geniza to our palaeographic knowledge, see M. Beit-Arié, 'The Contribution of the Fusṭāṭ Geniza to Hebrew Palaeography,' *Pe'amim*, 41 (Autumn 1989), pp. 32-40 (in Hebrew).

[24] This practice was already established in Tannaitic law, e.g. in Mishna Tractate Shabbat 16:1 and in the Babylonian Talmud, Megilla 26b. A parallel Islamic practice (according to literary sources) was to bury worn out or defiled holy scriptures, which was at times expanded and applied also to texts that contained quotes from the Qur'an (although they also proposed other methods of handling these texts, especially consigning them to be burned). The Islamic customs, traditions and finding have been studied by Yosef Sadan, who discusses them extensively in several articles, by means of comparison to the Jewish custom, and these too should be consulted for the sake of understanding the Jewish geniza and literature pertinent to it. See J. Sadan, 'New Materials Regarding Purity and Impurity of Books in Islam in Comparison with Judaism: Al-Burzulī and other Muslim Scholars on Defiled Parchment, Papyrus and Paper', *Jerusalem Studies in Arabic and Islam*, 33 (2007), pp. 193–218 (in which one can find a rich bibliography concerning the Jewish geniza as well, and references to Sadan's earlier articles on this topic); for a Hebrew version of this article, see Y. Sadan, 'Tohora, tum'a, u-geniza – bein Islam la-Yahadut,' *Pe'amim*, 70 (1997), pp. 4-20; and cf. his article ''al geniza etsel ha-muslemim: darkhei tippul be-kitvie ha-qodesh she-balu ba-Islam ve-liqḥan ha-yehudi ve-ha-'enoshi,' *Kiryat Sefer*, 55 (1980), pp. 398-410 and in Y. Yinon (Fenton)'s article, *ibid*. 56 (1981), pp. 540-549. Mark Cohen has published a detailed survey of ancient Islamic genizas that were discovered in the twentieth century: M.R. Cohen, 'Geniza for Islamicists: Islamic Geniza, and the "New Cairo Geniza"', *Harvard Middle Eastern and Islamic Review*, 7 (2006), pp. 129–145. Islamic genizas, like the Jewish ones, were located in mosques, and they attest to a custom resembling the Jewish practice. Although these repositories contain almost exclusively worn out Qur'ans, in the geniza of the Umayyad mosque in Damascus there were found fragments of literary works as well as a few documents (*ibid.*, p. 137). Cf. *ibid.* (p. 139-140), for an account of the late Jewish geniza discovered in the excavation of the Bastin cemetery near Fusṭāṭ during the 1980s. The source of the Mosseri Geniza collection, kept today in the Cambridge University Library, is also in this cemetery. See further, ibid., (p.145, note 2) the testimony of the Archbishop of the Syrian Orthodox Church on the custom of burying or burning pages of Christian scriptures.

texts and documents that do not even contain verses from the Bible; nor did the custom derive from the sanctity of the Hebrew language, since many of the documents were written in Arabic (using Hebrew letters), but rather from the very fact that they were inscribed in Hebrew letters. Although mixed in among the tens of thousands of fragments some documents in Arabic writing were found,[25] the *geniza* custom – whether this meant the accumulation or eventual interment of the book remains – appears to be rooted in the sanctity endowed to the Hebrew letters by the Holy Scriptures that were written in this script.

The second class of book fragments are the folios or bifolia of codices, nearly all of parchment, which survived because they were reused, usually as raw material for binding or for reinforcing the binding of manuscripts, and especially of early printed books in the Latin script, and only occasionally as recycled writing material after the original writing was erased and after which were inserted into Latin manuscripts for the purpose of copying (palimpsest).

With the invention of printing and the increase of printed books many manuscripts were weeded out from European libraries during the final quarter of the fifteenth century and were replaced with printed books. Because of the availability of these parchment manuscripts in Latin scripts, which were worn out and no longer in demand, the practice of taking apart their folios and bifolia and using them as binding material for printed books in Latin script became widespread in European collections from the sixteenth century onward. Unbound parchment quires that had been taken apart and used as premium raw material, expensive unto itself, but economical in its secondary uses for inserting front and back protective fly leaves, for covering the back of the book, lining the boards or for bindings proper.[26] A similar but somewhat less frequent use

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[25] See C.F. Baker & M. Polliack, Arabic and Judaeo-Arabic Manuscripts in the Cambridge Genizah Collections: Arabic Old Series (T–S Ar. 1a-54) (Genizah Series 12), Cambridge 2001, p. ix.

[26] On the reasons for this phenomenon and a description of secondary uses of dismantled manuscripts see Nicholas Pickwoad's richly illustrated article, N. Pickwoad, 'The Use of Fragments of Medieval Manuscripts in Constructing and Covering of Bindings of Printed Books', in *Interpreting and Collecting Fragments of Medieval Books – Proceedings of the Seminar in the History of the Book to 1500, Oxford 1998*, ed. L.L. Brownrigg & M.M. Smith, Los Altos Hills, Ca. – London 2000, pp. 1–20. The author notes that the spread of printing led to the thinning of ecclesiastical manuscript collections and the sale of manuscripts that were deemed superfluous to binders. He also argues that the Reformation that took place in the northern European countries resulted in the flooding of the marketplace during the 1520s with a great number of manuscripts that were meant to be recycled, but he has difficulty explaining the widespread use of parchment folios from Church collections in countries that remained Catholic. Parchment sourced from medieval manuscripts continued to be used for binding until the beginning of the seventeenth century throughout almost all of Europe, especially in German speaking regions, in

was made of parchment folios and bifolia taken from Hebrew manuscripts, which have and continue to be discovered in recent years in European libraries, especially in the bindings of Latin books in collections in Austria (in the National Library and in monastic libraries) and in Germany.[27] Similarly, albeit in a more concentrated and conspicuous form, thousands of parchment folios and bifolia from Hebrew codices dating from the eleventh century onward have been discovered in the past decades in many state and city archives and in the cities of central and northern Italy, where they were used as soft binding material for notary registries from the sixteenth century.[28] A few of these yielded discoveries of heretofore unknown texts. The tendency to use the

which the practice continued even beyond that date (*ibid.*, pp. 1-3). On the recycling of parchment in bindings, see also J.A. Szirmai, *The Archaeology of Medieval Binding*, Aldershot 1999, pp. 147–178 .

[27] See *Genizat Germania: Hebrew and Aramaic Binding Fragments from Germany in Context*, ed. A. Lehnardt, Leiden–Boston 2009, and especially the introduction by the author which contains an exhaustive historical review of the interest in fragments of this kind and their study from the sixteenth century onwards (pp. 1-28, esp. pp. 7-15). On the fact that Christian scholars, and especially those who studied the Bible's textual versions, knew about the phenomenon of these fragments and recognised their importance, cf. the discussion by S. S. Campanini, 'Carta Pecudina Literis Hebraicis Scripta: The Awareness of the Binding Hebrew Fragments in History – An Overview and a Plaidoyer', in *Books within Books: New Discoveries in Old Book Bindings*, ed. A. Lehnardt & J. Olszowy-Schlanger ('European Genizah' – Texts and Studies 2), Leiden–Boston 2014, pp, 11–28. The uncovering of fragments used for the binding of non-Hebrew books in European libraries is continuously expanding in European countries and is gaining pace thanks to the 'Books within Books (BwB)' initiative headed by Judith Olszowy-Schlanger. The project's website includes links to the detailed catalogues of the fragments that were discovered in countries in which there is a systematic effort to discover them, such as Austria, Germany, France, Poland, the Czech Republic, and Sweden.

[28] See above, chapter 1, note 57. For the claim that most of the fragments used in Italian archives were taken from the dismantling of Sefardic and especially Ashkenazic manuscripts, because of their large dimensions which were greater than the usual dimensions of Italian manuscripts, see M. Beit-Arié, 'The Contribution of Medieval Hebrew Manuscript Fragments to Hebrew Codicology', in *Fragmenta ne pereant: Recupero e studio dei frammenti di manoscritti medievali e rinascimentali riutilizzati in legature*, ed. M. Perani & C. Ruini, Ravenna 2002, pp. 83–88 (and see *ibid.* the article by Edna Engel in which she juxtaposes a selection of fragments with dated manuscripts, E. Engel, 'Evolutionary Stages of Medieval Hebrew Scripts as Reflected in the "European Genizah"'). Just as the large number of dismantled Sefardic and Italian manuscripts used for coverings in Italian archives does not attest to their prevalence among Italian Jews, so the classification of the textual genres within these manuscripts cannot provide grounds for characterising the Jewish libraries in Italy in respect to their subject matter. The preponderance of Talmudic, Midrashic, and Halakhic texts that has been discovered in these coverings does not necessary allow us to infer that their proportion within Jewish society was large, but rather that for the purpose of secondary use there was a demand for large sized manuscripts which were characteristic of these genres. The same inference in regard to the Italian archives can be made in regard to the many parchment bifolia in Hebrew scripts that have survived in the bindings of manuscripts and print books in libraries in Austria and Germany. They derive from oversize manuscripts and therefore virtually all of them represent book genres which were written in large formats in Ashkenaz – biblical books, Talmudic and halakhic literature, liturgy, and Kabbala (parallel to the high proportion of legal and liturgical literature in fragments of Latin manuscripts that were widely recycled in the making of Latin book bindings).

designation 'geniza' ('the Italian Geniza' or 'the European Geniza') for these recycled fragments is erroneous and misleading.

Unlike the circumstances that made the abovementioned Latin manuscripts available, the circumstances by which the Hebrew manuscripts were dismantled and reused for the binding of books in libraries and for notary registries in archives were not related to the desire to get rid of unneeded copies. The possibility that the Hebrew manuscripts which were produced independently outside an institutional context and privately held were pushed aside to accommodate print books, as the Latin manuscripts had been, cannot be reconciled with the scope of Hebrew books that were printed before the sixteenth century. Furthermore, even the possibility that damaged or worn out Hebrew manuscripts that were no longer wanted were sold as raw material for preparing bindings is improbable due to the practice of keeping such books in a geniza. Fragments and bits of parchment bifolia of Hebrew manuscripts from Germany in the twelfth through the early fifteenth century were used as raw material in the bindings of hundreds of Latin manuscripts found in the old collection of the University of Vienna and are now kept in the Austrian National Library. It appears that these Latin manuscripts were bound in the middle of the fifteenth century close to the time of the expulsion of Jews from Vienna.[29] The chronological coincidence of events in relation to these manuscripts applies also to the Italian registries whose bindings were made from fragments of Hebrew manuscripts shortly after the burning of the Talmud in Italy in 1553. Both these examples may indicate similar circumstances underlying the reuse of bifolia removed from Hebrew manuscripts for binding Latin books in other times and places, as well as the need to investigate the dating's of the bindings in order to shed light on circumstances by which the Hebrew fragments came to be used.

Hebrew manuscript folios whose writing had been rubbed out or blurred, and which were then incorporated into Latin manuscripts quires as recycled writing material and rewritten upon, are only seldom discovered;[30] not so the relative preponderance of early

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[29] This information was communicated to me personally in 2009 by Franz Lackner, a member of the team of cataloguers of Latin manuscripts in Austria, under the auspices of the Austrian Academy of Science.

[30] Such as folios that were cut from a scroll that contained the liturgy and piyyutim for Yom Kippur (the Day of Atonement), written over in Latin script, and incorporated into a Latin manuscript from the eight century apparently, in the Bobbio Abbey in northern Italy, and which eventually were found in tertiary use as protective folios in a later Latin manuscript. See M. Beit-Arié, 'The Munich Palimpsest: A Hebrew Scroll Written Before the Eighth Century', *Kiryat Sefer*, 43 (1967- 68) (in Hebrew), pp. 421-428. In 2008, in the private library of the monks of the ancient Monte Cassino library in Italy, I happened to

palimpsests that have been that have been found, especially in the Cairo Geniza, which demonstrate the recycling of Christian manuscripts within Hebrew manuscripts – the original writing was in Christian Aramaic, Greek, or Syriac, whereas the Hebrew script was the secondary writing.[31]

Sixteenth century registries in the state archive in Bologna, bound in folios from Hebrew manuscripts
Courtesy of Mauro Perani

come across two large non-consecutive bifolia from *Hilkhot Alfasi* with a commentary, written in a square and semi-cursive Ashkenazic script from circa 1300, which had been rubbed out and were only partially legible; they had been recycled in the monastery and rewritten in Latin inside an oversize decorated volume of Church liturgy from the sixteenth century (each bifolia of the original Hebrew was spread open and served as a single folio in the Latin manuscript).

[31] See above, chapter 1, notes 19, 69, and chapter 2, note 7.

Backing of a binding made from bifolia of a biblical manuscript in an Italian archive
Crevalcore, Archivio Communale Fr. 1, Courtesy of Mauro Perani

Secondary strata

The archaeology of manuscripts uncovers for us those foundation layers and units of the codex created in the process of consolidation of the manuscript that are related to its very writing and composition, and these elements were described above. Alongside these, one finds in the manuscripts smaller secondary layers representing various additions that owners and other users added to the manuscripts while they existed and were in use.

Addenda and Collectanea copied by the owner

Brief texts or collectanea were copied on the pages that remained empty at the beginning, middle, or end of the manuscript. In many manuscripts, it was uncustomary to begin the copying on the first page or first folio, which were left empty in order to protect the written text from wear. Similarly, it was customary in many manuscripts to leave one page or even a folio empty in the body of the manuscript at the ends of bibliographical sections such as divisions of the Bible or at the end of separate works.

Of course, pages were often left empty at the end of manuscripts, sometimes there were many leftover pages from a final quire containing more folios than were needed to complete the copying. These empty pages (and sometimes parts of pages or even just margins) did not remain empty over time. Owners would often use them for copying all sorts of writings that came into their possession – short texts, some perhaps related to the content of the manuscript, and others entirely unrelated assorted texts and varia.

Annotations

Marginal annotations and emendation that were added to the copied text over generations – sometimes over centuries –by educated and learned users, constitute another secondary stratum in the archaeology of manuscripts that holds great importance for the history of the texts within the codicological units. Marginal annotations of this kind, which are more common in halakhic and scientific texts, include brief glosses, corrections of corrupt wordings, and completions of elisions, variant textual witnesses, commentaries and short or long addenda. These annotations are of course of great value to the text-critical scholar's efforts to uncover the text's reception, influence, and the extent of its use; but first and foremost, like the above-mentioned additions copied by the owners, they are evidence of the vicissitudes of the manuscript itself. Based on the script types of the annotations, one can estimate the dating of the annotations and identify the regions to which the manuscript travelled, and thus trace its 'biography'. Just as it is necessary to identify and separate between the hands that participated in the copying and to determine the boundaries of their copying, so must the textual scholar who intends to prepare a critical edition and the historian who aims to trace the book's vicissitudes take care to separate the various layers of the added annotations, for they should not be regarded as monolithic. The task of separating these strata is frequently more difficult than that of separating the hands that copied the texts in a coordinated way, since the non-consecutive writing in the narrow margins cannot sufficiently represent the full range of idiosyncratic characteristics that receive visible expression in the regular writing within the boundaries of the written area, such as the method of line management or the form of the titles. This is especially the case when most of the annotations were written with the same script type in adjacent time periods. Nevertheless, the identification of the hands of the annotators should still be deemed important, and an effort should be made to distinguish among them and to estimate the chronology of the annotations and their original provenance.

In the annotations that manuscript users added over time, it was customary to employ markings similar to those used by medieval copyists (see above, at the end of chapter 8). The most common of these was the tailed circle. In many manuscripts the completion of elided words in the margin was indicated by the heading ד״ך, which according to R.N.N Rabinowitz may have been an acronym for דוכתיה כאן.[32]

Owners' records

 Some manuscript owners used the pages that had been left either completely or partly empty (and sometimes even pages they themselves added to the beginning or the end of the manuscript) for keeping personal records. Here one might find family records such as births and deaths, library inventories, chronicles, detailed deeds of sale of the book and records of ownership, some of which sometimes (especially in Italy) contained information about the manuscript's former owners, the date and place of its purchase and the price paid for it or an estimate of its monetary value, especially when the manuscript had come into the owner's possession through the division of an estate among heirs.

When dealing with either literary or documentary texts that were copied onto pages that had been left mostly empty, one must carefully separate them from the text of the original manuscript and identify their source and date, even though they are inscribed on the same writing material. All the personal records that were added to the original manuscript are of great importance for tracking the vicissitudes of its history, especially for tracing its passages through different regions and the sequence of its ownership. It goes without saying that markings of ownership, records of the owners, documents of transfer of ownership, and inventories of other books owned by them are a valuable source not only for the history of the book and its consumption, the history of reading and the sociology of book collection, but they are also authentic documents which can greatly enrich the social and intellectual history as well as the prosopography of Jewish diasporas. It seems that their utility has not been comprehensively exhausted since the pioneering research by Moshe David Cassuto about the history of Florentine Jews during the Renaissance.[33]

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[32] *Diqduqei Sofrim*, 9: Sanhedrin, Munich 1875/6, p. [1], in the note.

[33] See M. Beit-Arié, 'Cassuto the Codicologist,' in R. Bonfil, ed., *Umberto (Moshe David) Cassuto* , Jerusalem 2007, pp. 19-24.