THE MS. PARMA 1959 IN THE CONTEXT OF PORTUGUESE HEBREW ILLUMINATION

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MESTRADO EM ARTE, PATRIMÓNIO E TEORIA DO RESTAURO

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À minha família
ABSTRACT

This dissertation focuses on the Ms. Parma 1959 within the context of Hebrew sacred book production in Portugal in the second half of the fifteenth century. The Ms. Parma 1959 offers a unique insight into Jewish intellectual life and artistry in mid-fifteenth century Portugal. It is a compilation of several texts dealing with the copy and illumination of Hebrew texts. However, it has never been considered in the Jewish production context. In fact, little attention has been given to the almost 60 Hebrew manuscripts associated with Portugal, more than half with illumination, and their role and relevance in the history of Portuguese and Jewish art is yet to be fully assessed.

The first text included in the Ms. Parma 1959, the Livro de Como se Fazem as Cores das Tintas allows a rare glimpse of the state of craftsmanship regarding book illumination techniques in fifteenth-century Portugal. This text is the sole medieval Portuguese technical source concerning artistic practices, and its relationship with Latin and vernacular Portuguese manuscripts has already been confirmed. Despite being included in a predominantly Hebrew volume, the Livro das Cores is yet been studied in the context of Hebrew book illumination.

The following dissertation is divided in three related parts: Part One establishes the historical, technical and artistic background of Hebrew book production in Portugal and, consequently, of the Ms. Parma 1959. In Part Two the texts included in the Ms. Parma 1959 are analysed, as well as its main codicological and palaeographical features and the most relevant iconographic elements. Part Three is dedicated to the Livro das Cores: the text is considered in the context of medieval treatises, the language used is evaluated in the context of Judeo-Portuguese and the recipes included are analysed.

The main conclusion of this dissertation is that the Ms. Parma 1959 is a coherent volume that can be divided in three main themes: (i) para-textual aspects in the copy of Hebrew sacred texts; (ii) halakhah; and (iii) Jewish liturgy and therefore should be considered in the general context of Hebrew book production in Portugal. According to the watermarks and the information on the colophon, the volume was most likely was copied c. 1462 by Abraham ibn Hayyim.

Keywords: illumination; Hebrew, multiculturalism; palaeography; codicology; cultural heritage
Resumo

A presente dissertação é dedicada ao ms. Parma 1959 no contexto de produção de iluminura em textos hebraicos em Portugal, na segunda metade do século XV. O ms. Parma 1959 é um volume manuscrito, composto por vinte textos relacionados com as especificidades da cópia e iluminação de textos hebraicos. Considerando a provável data da composição do ms. Parma 1959 e a sua temática, a dissertação elaborada tem por principal objectivo a determinação da sua possível relação com os manuscritos hebraicos copiados e iluminados em Portugal, na segunda metade do século XV.

Ao longo da história da Arte Judaica, os manuscritos são um dos veículos preferenciais de expressão artística e cultural. Por intermédio do seu conteúdo, o ms. Parma 1959 oferece uma perspectiva singular do meio intelectual e artístico judaico num momento considerado como apogeu da comunidade judaica medieval em Portugal. Embora existam exemplos anteriores de cópia de textos hebraicos, os anos finais do século XV testemunham uma actividade artística e cultural judaica sem precedentes, que se traduzem em magníficos exemplos de iluminura hebraica sefardita, principalmente caracterizada pelo uso de decorações micrográficas e tarjas decorativas de inspiração italiana e flamenga.

A estrutura necessária para a produção de textos hebraicos iluminados em Portugal, deve-se, essencialmente, à conjugação de dois factores: a existência de uma comunidade – com o conhecimento técnico necessário e com um papel activo nas dinâmicas cultural, social e económica do país – que servia de “audiência”, aliada à imigração significativa de judeus espanhóis. Este último factor, por um lado, alterou significativamente a estrutura da comunidade judaica portuguesa e, por outro, contribuiu significativamente para o conhecimento técnico como para o alargamento da “audiência” da produção artística e cultural judaica.

A iluminura hebraica portuguesa marca o fim de um período de grande prosperidade cultural e desenvolvimento artístico judaico na Península Ibérica. Contudo, a iluminura portuguesa é, frequentemente, tida como pouco original e como mera continuação da iluminura castelhana do século XV, que, por sua vez, reflecte a condição de declínio das comunidades judaicas peninsulares a partir dos meados do século. No entanto, além de as circunstâncias históricas e de o ambiente cultural vivido em Portugal serem significativamente diferentes, a iluminura hebraica portuguesa possui características distintas das de outros grupos peninsulares, revelando grande maturidade artística. A ser vista como reflexo da
situación da comunidade judaica portuguesa, a iluminura hebraica portuguesa deverá, pois, ser interpretada não como símbolo de declínio, mas antes de elevação e assimilação cultural.

Incluído no ms. Parma 1599, o Livro de como se fazem as Cores das Tintas é a única fonte portuguesa medieval relativa à preparação de pigmentos e tintas para iluminação de livros. O seu texto permite um raro relance sobre o estado da tecnologia da época no que toca às técnicas de iluminação. O Livro das Cores é um texto anónimo, escrito em língua portuguesa, muito provavelmente com mais do que uma fonte, e que se encontra transliterado em caracteres hebraicos nos primeiros fólios do ms. Parma 1599. A combinação da língua portuguesa com a escrita em caracteres hebraicos, bem como a ausência de características tipicamente judaicas no Livro das Cores devem ser interpretadas como sinal de assimilação cultural e, possivelmente, de uma dinâmica cultural com a maioria cristã.

Embora se desconheçam outros exemplares, o Livro das Cores incluído no ms. Parma 1599 terá sido copiado por Abraham ibn Hayyim, cuja assinatura ornamentada se encontra no último fólio do texto. O mesmo nome surge novamente no início e no colofone de outro texto incluído no ms. Parma 1599, a Lista de letras irregulares incluídas num rolo da Torah. O colofone informa igualmente que o texto foi copiado em Loulé, em Maio de 1462. Esta data é confirmada pelas marcas d’água do papel e pela paleografia do manuscrito.

De acordo com as marcas d’água e vários aspectos codicológicos e paleográficos, o ms. Parma 1599 terá sido copiado num curto espaço de tempo pela mesma pessoa. Para tal conclusão contribui a grande regularidade no que diz respeito às margens, disposição da página, número de linhas e consistente paleografia. Considerando o colofone existente, a assinatura no Livro das Cores faz de Abraham ibn Hayyim o expectável copista e compilador do ms. Parma 1599, embora não seja ele o autor do Livro das Cores. Ponderando, igualmente, o colofone e as marcas d’água, considera-se que o volume terá sido composto em 1462.

O ms. Parma 1599 é, pois, uma compilação organizada de textos relacionados com a cópia e iluminação de textos hebraicos sagrados, que podem ser divididos em três grandes assuntos: aspectos para-textuais associados à cópia e iluminação de textos sagrados, halakhah e liturgia judaica. Cada um destes temas está escrito em um modo específico de escrita, pelo que as aparentes diferenças paleográficas são, na verdade, manifestações da operacionalidade do hebraico. A escrita do ms. Parma 1599 divide-se em quatro modos: semi-cursivo, semi-cursivo corrente, cursivo e quadrado.

Cada um destes modos está directamente associado a uma das temáticas do volume. Textos que dizem respeito a assuntos para-textuais relacionados com a cópia e iluminação de textos hebraicos sagrados estão escritos em modo semi-cursivo, com a excepção dos textos de tefillin, cuja escrita quadrada se prende com a natureza do texto; das receitas escritas em modo
cursivo que, no entanto, podem ser consideradas como adições posteriores; e as notas da masorah, cuja escrita é feita em vários modos, muito provavelmente por ser uma lista de anotações. Textos relacionados com a liturgia judaica estão igualmente escritos em modo semi-cursivo. Finalmente, textos que dizem respeito à halakhah estão escritos em modo semi-cursivo corrente.

A presente dissertação divide-se em três partes: na primeira parte, estabelece-se o contexto histórico subjacente à produção de manuscritos e outros textos judaicos em Portugal e, por extensão ao ms. Parma 1959. Os aspectos técnicos intrínsecos à cópia e iluminação de textos hebraicos sagrados são descritos. A iluminura hebraica portuguesa é caracterizada, considerando o ambiente peninsular artístico subjacente à produção em Portugal.

Na segunda parte, os textos incluídos no ms. Parma 1959 são descritos e analisados. As principais características codicológicas são avaliadas e a paleografia do manuscrito estudada. Os mais relevantes elementos iconográficos são igualmente determinados, tendo em consideração as possíveis relações com outros manuscritos hebraicos de origem portuguesa.

A terceira e última parte centra-se no Livro das Cores. O seu texto é contextualizado em relação a outros tratados medievais. A linguagem utilizada é avaliada em relação ao Judeo-Português. As práticas descritas são finalmente analisadas de forma a permitir uma futura comparação com a iluminura em manuscritos hebraicos de origem portuguesa.

Palavras-chave: iluminura; Hebraico; multiculturalismo; paleografia; codicologia; património cultural
This dissertation is the culmination of a long journey. Some years ago, when I came across with two books on Portuguese Hebrew manuscripts, I could never imagine the path laying ahead of me. My growing interest in Hebrew manuscripts eventually took me to Jerusalem, and more recently, to Lisbon.

This journey has not been lonely and I am sincerely thankful to many people. First, I would like to express my gratitude to my supervisor, Prof. Dr. Luis Urbano Afonso, for his friendship and constant support during the development of the dissertation. I am thankful for all the opportunities he has created for me, as they have been vital to my academic growth. I must also thank Prof. Dr. Paulo Farmhouse Alberto, who generously allowed me to participate in his Codicology seminar.

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LIST OF ABBREVIATIONS

BAV  Biblioteca Apostolica Vaticana
BL   British Library
BNF  Bibliothèque Nationale de France
BNP  Biblioteca Nacional de Portugal
Bodl. Bodleian (Library)
BPMP Biblioteca Pública Municipal do Porto
BPP  Biblioteca Palatina de Parma
c.    circa
fol.  folium
foll.  folia
HSA  Hispanic Society of America
HUC  Hebrew Union College
JTSA Jewish Theological Seminary in America
Ms.  manuscript
NLI  National Library of Israel
r    recto
RSL  Russian State Library
v    verso
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Introduction
1 | RESEARCH OVERVIEW

In this introductory chapter we establish what are the main reasons for the present research. We contextualise the Ms. Parma 1959 within the scope of Portuguese and Jewish Art History. We examine the previous studies on the Portuguese Hebrew illumination, as well as those on the Ms. Parma 1959 and on the Livro das Cores. We describe the main research questions and we establish what is the merit and the impact of this research.

1. Justification of research

Within the field of Portuguese and Jewish Art History, little attention has been given to the almost 60 Hebrew manuscripts associated with Portugal, more than half with illumination and other forms of decoration. The two sole studies\(^1\) on this matter date from the 1970’s and are contradictory and their resulting opposing positions undermine all subsequent research. This means that the role and the impact of the Portuguese Hebrew manuscripts in the history of Portuguese Art is yet to be ascertained. Similarly, their importance in the general context of Hebrew manuscripts, and by extension in the history of Jewish Art, is not yet fully appraised.

The Ms. Parma 1959 conveys an unequivocal background, that of the copy and illumination of sacred Hebrew texts in Portugal during the fifteenth century, thus coinciding with the moment of the most intensive cultural Jewish production. As constituent of the corpus of Portuguese Hebrew manuscripts, the relatively small volume that is the Ms. Parma 1959 (144 x 102 mm) offers us a rare glimpse of the “mental universe of the medieval [Portuguese] Jew”\(^2\). Furthermore, and considering its features, the Ms. Parma 1959 can be viewed as the underlying element to the rest of Portuguese Hebrew texts. Likewise, and considering its linguistic features, it can be interpreted as a sign of acculturation (though not in the sense of assimilation).

In addition, the Ms. Parma 1959 provides a unique insight of what was then the state of craftsmanship regarding book illumination techniques, particularly through its first text, the

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Livro de como se fazem as cores das tintas para iluminar (henceforth, Livro das Cores). This is undoubtedly the best known text of all that are included in the volume, and it is the “only medieval Portuguese technical source concerning artistic practices”\(^3\). The role of the Livro das Cores in the context of Portuguese book illumination is gradually being assessed. There is already a significant number of studies relating it to non-Jewish book production in Portugal\(^4\). However, there is no research on its role within Jewish book production, despite the fact that it is written with Hebrew script and its sole known copy is included in a compilation where the majority of texts is written in the Hebrew language.

In addition to the Livro das Cores, the Ms. Parma 1959 possesses other relevant texts such as an unstudied collection of liturgical poems. Their study will surely contribute to our knowledge on medieval Portuguese Jewish liturgy. Also, it includes a rare text on the anomalous letters found on a Torah scroll, a tradition long lost, but perhaps associated with the thirteenth-century circle of Shem Tov ben Abraham ibn Gaon and thus an interesting text by itself.

Until very recently, there has not been sufficient elements to associate the Ms. Parma 1959 with the production of Hebrew manuscripts in Portugal\(^5\). Yet, the Livro das Cores presupposes the existence of an audience, most likely illuminators from the Portuguese Jewish community, and the nature of other texts included in the volume point to a common theme, that of the copy (and decoration) of Hebrew sacred texts\(^6\). It is thus crucial to perform an extensive study on the Ms. Parma 1959 in order to fully establish its role in the context of the Portuguese Hebrew book production in the second half of the fifteenth century, as well as to understand the environment of such production in a remarkable moment of the history of the Jewish communities in Portugal.

Finally, little attention has been given to a possible cooperation or a mutual influence between the Jewish minority and the rest of the Portuguese population in terms of book production. The fact that the Livro das Cores is written in Portuguese with Hebrew script, as well as the writing of additional recipes in the same fashion can be an indication of a well-assimilated minority (at least in cultural terms) or a mutual sharing of knowledge.

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\(^6\) Cruz and Afonso, *On the Date and Contents, 9.*
2. Research Background

The Iberian Peninsula until the end of the fifteenth century was the stage of a significant cultural and artistic Jewish production. Even though all forms of art were restricted by iconoclastic impositions determined in the mosaic law, examples of artistic excellency survived to this day, most commonly in terms of book illumination. There is no doubt that Hebrew book illumination is essential as a form of artistic expression and as a reflection of the medieval Jewish society, as well as a frequent testimony of cultural exchange and interaction with the prevailing society.

In Portugal, Jewish artistic production prior to the fifteenth century is practically unknown. The final decades of the century, however, demonstrate the mastery of Portuguese Jews and the evolution of a particular style demarcated from the rest of the Peninsula. Jewish-Portuguese artistic expression is mostly materialised in illuminated manuscripts and in incunabula that result from the activity of Jewish printers.

The fifteenth-century timeframe is particularly interesting, as it coincides with what can be considered as the apogee of the Jewish community in Portugal. Two circumstances contributed to such: (i) the flourishing community established in the country for centuries progressively gained a pivotal role in the Portuguese Expansion7; and (ii) the massive influx of Spanish Jews into Portugal, that forever changed the social and cultural dynamics of the communities across the country8.

The influx of Spanish Jews has been pointed as the main reason for the practice of Hebrew book illumination in Portugal. To this view contributes the evaluation of the Portuguese style as a direct continuation of other pre-existing schools, particularly the Castilian school. It should be noted that all research on the Portuguese Hebrew manuscripts are summarised in two main positions. The first represented by Thérèse Metzger9 rejects the idea of an organised centre for book illumination in Lisbon and views Portuguese Hebrew illumination as a continuation, or rather, the decline of Hebrew illumination practised in other Iberian centres. Metzger, who is particularly critical of the Portuguese production, views it as heterogeneous, temporary and accidental.

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9 Metzger, Les manuscrits hébreux copiés et décorés à Lisbonne.
A second and opposing position, represented by Gabrielle Sed-Rajna, underlines the programmatic coherence of Portuguese manuscripts that must be interpreted as the result of a common effort. That is, Sed-Rajna sustains that there was a specific centre for the copy of Hebrew manuscripts in Lisbon in the second half of the fifteenth century. The author does not view Portuguese manuscripts as isolated productions but rather as the result of the activity of a school of Jewish scribes and illuminators in Lisbon, thus known as the “Lisbon school”. According to Sed-Rajna, Portuguese manuscripts show a striking homogeneity in terms of conception and execution of the decorative programmes, which may point to the use of the same methods and perhaps the same stencils.

Other para-textual elements such as a characteristic binding have been used to establish the corpus of the Hebrew manuscripts associated with Portugal, especially in the case of the inexistence of a colophon. In fact, the same binding is found in other manuscripts such as the Kennicott Bible, a circumstance that raises new questions such as the association of this Bible with Portugal. This is a possibility already mentioned by Leila Avrin in regard to the binding itself and by David Blondheim, in relation to the association of the Kennicott Bible’s illuminator (Joseph ibn Hayyim) and the only name stated in the single colophon in the Ms. Parma 1959 (Abraham ibn Hayyim).

It should be noted that there are no substantial evidences of an organised Jewish centre destined to the copy of Hebrew manuscripts in Lisbon and, by extension, their binding. In fact, and contrary to the traditional environment of the copy of Latin and Greek books, Jewish books were essentially copied for personal use or for a specific recipient, but seldom prepared in a commercial structure of mass-production of books.

Still, records of several religious schools in Lisbon (where the copy of manuscripts must have been part of the teaching) contribute to the interpretation that there was a specific place of copy and illumination of manuscripts in Lisbon, as initially suggested by António Ribeiro.

---

11 Gabrielle Sed-Rajna, Manuscrits hébreux de Lisbonne. In the introduction of her work, Sed-Rajna begins by justifying the existence of such school with the calligraphic tradition and the ornamental manuscript production in Portugal, which is later continued in the Hebrew incunabula.
12 Gabriel Sed-Rajna, The Lisbon Bible, 1482 (Tel Aviv: Nahar Miskal with the British Library, 1988).
14 Ibid.
dos Santos\textsuperscript{17} and later considered by Sed-Rajna. It is possible that the social structure of the Jewish communities in Portugal may have contributed to an exceptional case of “mass-production” of books in Lisbon, by the end of the fifteenth century.

The historical circumstances after 1496 clearly undermined the Portuguese Jewish artistic and cultural patrimony. Books in particular were easy targets of destruction, smuggling and repossessing. The known manuscripts are, we believe, a fraction of what may have been the amount of Jewish books in Portugal in the second half of the fifteenth century. Not only books were being constantly copied and printed (as confirmed by the colophons), there was a great amount of books circulating that had been brought by Spanish Jews.

This means that the survival of Hebrew manuscripts across Europe is greatly due to the interest and effort of Christian scholars such as Benjamin Kennicott and Giovanni Bernardo de Rossi. Less fortunate were manuscripts owned by European Jews, as due to so many historical constraints their large majority has disappeared. Among the most important collections of Hebrew manuscripts is de Rossi’s, currently held at the Biblioteca Palatina de Parma. De Rossi was a professor of Oriental languages at the University of Parma from 1769 to 1834, and he was able to gather and describe in an extensive catalogue c.1500 Hebrew manuscripts. His collection was subsequently acquired by Maria Louisa the Duchess of Parma in 1816, and subsequently donated to the Biblioteca Palatina de Parma. De Rossi’s collection of Hebrew manuscripts is considered as one of the most important collections in the world\textsuperscript{18}. The Ms. Parma 1959, initially part of de Rossi’s collection as Ms. 945, was described for the first time in 1804\textsuperscript{19}.

Regarding the volume itself, there is no consensus relatively to the intention or spontaneity in the organisation of the volume. Sed-Rajna suggests an artificial collection\textsuperscript{20}, whereas Metzger asserts that this is not a casual compilation of independent texts and despite the calligraphic differences there are similarities in terms of format, justification, number of lines, composition of books and decoration that the author considers as homogenous\textsuperscript{21}. This view is further supported by António João Cruz and Luís Urbano Afonso\textsuperscript{22}.


\textsuperscript{20} Sed-Rajna, Manuscrits hébreux de Lisbonne, 13.

\textsuperscript{21} Metzger, Les manuscrits hébreux copiés et décorés à Lisbonne, 5.

\textsuperscript{22} Cruz and Afonso, On the Date and Contents, 4-5.
More recently, Afonso emphasises the diversity of calligraphy and suggests that more than one person intervened in the copy of the texts\(^{23}\). According to Afonso, two hands predominate and the differences may result from the compilation of independent texts or to additional information added subsequently\(^{24}\). Also, the variety of calligraphy does not necessarily exclude the possibility of ibn Hayyim\(^5\) being the author or the copyist of the previously mentioned texts, or perhaps the compiler of the entire volume.

Despite the fact that watermarks in the paper used in the volume point to its copy between 1423 and 1488, the date of the Ms. Parma 1959 was assumed to be 1262 for quite some time, due to the wrong interpretation of de Rossi. The colophon is written on the last page of a text regarding the anomalous letters found in an accurate Torah scroll, and it states that the text was written by Abraham b. Yehuda ibn Hayyim in Loulé (south of Portugal) in the Jewish year of 22. De Rossi interpreted it as being the year 5022 “in the sixth millennium”, thus corresponding to the year 1262 in the Gregorian calendar\(^{26}\).

In addition, there is a monogram on the last page of the *Livro das Cores* (which is written in Portuguese), that has been interpreted as Abraham ibn Hayyim’s signature. This was sufficient to assume that the whole volume was composed by ibn Hayyim, that is further confirmed by a marginal note on fol. 1r. This note informs that the *Livro das Cores* was also written by Abraham ibn Hayyim in the city of Loulé, in the year 22 of the sixth millennium. However, this note may be posterior to the rest of the text and the authorship and the date of the *Livro das Cores* has been challenged. David Blondheim questions the credibility of the marginal note and suggests that it must have been added in a subsequent moment\(^{27}\). Also, Metzger argues that the final monogram must have been added in a posterior moment using the only name available in the whole volume\(^{28}\), and she states that the ink used in the signature is different from the rest of the text.

In relation to the date of the Ms. Parma 1959 and the *Livro das Cores*, there is no consensus. De Rossi’s interpretation of the date has been frequently challenged. Leopold Zunz


\(^{24}\) Afonso, *New Developments in the study of O Livro de Como se Fazem as Cores*, 11.

\(^{25}\) We have tried to follow the transliteration system explained on p. xxi. However, we have maintained the writing of some names such as Hayyim in the traditional form (instead of Khayyim), so as to avoid confusion.


\(^{27}\) David Blondheim, "An Old Portuguese work on manuscript illumination".

\(^{28}\) Metzger, *Les manuscrits hébreux copiés et décorés à Lisbonne*. 
argues that the dates of the composition of the texts are ignored\textsuperscript{29}, and suggests it to be a sixteenth-century volume instead. Zunz bases his conclusion on the language employed, the inexistence of any indication of the sixth millennium in the colophon, and the similar calligraphy to other sixteenth century manuscripts. However, he does not exclude the possibility of the texts being copies of previous versions, which is a valid hypothesis, as there are other examples of colophons copied \textit{verbatim}\textsuperscript{30}. Yet, and more recently, the watermarks on the Ms. Parma 1959 leave no margin of a doubt that the volume was copied in the fifteenth century\textsuperscript{31}, which is further corroborated by the procedures and materials described in the \textit{Livro das Cores}, that are in total accordance with fifteenth century practices\textsuperscript{32}. Hence, the majority of studies place the Ms. Parma 1959 in the fifteenth century due to the paper watermarks\textsuperscript{33}, the texts included in the volume\textsuperscript{34}, the calligraphy\textsuperscript{35} and the practices described in the \textit{Livro das Cores}\textsuperscript{36}.

Frequently mentioned in historiographic works about manuscript illumination\textsuperscript{37}, the \textit{Livro das Cores} is not exactly a coherent and organised treatise, but rather an organised collection of recipes dealing with the preparation of pigments and paints, agglutinants and varnishes. There are references to gum arabic and turnsole, common ingredients in fourteenth and fifteenth century illumination practices; also, references to specific utensils that only became common after 1300 and to paper, only widely used in the fifteenth century.

\textsuperscript{29} Zunz states that “frequently De Rossi dates the calligraphy as being older that it really is”, and that “he ignores the lifetime of the authors and the dates of the texts”: Leopold Zunz, “Die hebräischen Handschriften in Italien. Ein Mahnurf des Rechts und der Wissenschaft,” \textit{Gesammelte Schriften} 2 (1876): 5.

\textsuperscript{30} Sirat, \textit{Hebrew Manuscripts}, 209.

\textsuperscript{31} Benjamin Richler and Malachi Beit-Arié (eds.), \textit{Hebrew Manuscripts in the Biblioteca Palatina in Parma} (Jerusalem: Jewish National and Library University, 2001), 472.

\textsuperscript{32} Mark Clarke, “The context of the Livro de como se fazem as cores: late mediaeval artists’ recipe books (14\textsuperscript{th}–15\textsuperscript{th} centuries),” in \textit{The Materials of the Image}, \textit{As Matérias da Imagem}, ed. Luís U. Afonso (Lisboa: Campo da Comunicação, 2010), 60.

\textsuperscript{33} Richler and Beit-Arié, \textit{Hebrew Manuscripts in the Biblioteca Palatina in Parma}, 473.

\textsuperscript{34} Ibid.

\textsuperscript{35} Metzger, \textit{Les manuscrits hébreux copiés et décorés à Lisbonne}, 5.

\textsuperscript{36} Clarke, \textit{The context of the Livro de como se fazem as cores}, 60.

Cruz and Afonso underline the lack of a coherent structure throughout the text, that according to Afonso may be justified with the existence of two incipits. This suggests more than two sources and the division of the text itself in three distinct parts. Also, the text lacks coherence in terms of used nomenclature, as same materials have different (several) names.

The Livro das Cores has been translated to several languages. In 1928, David Blondheim provided the first Hebrew transcription, transliteration and English translation. In his work, Blondheim underlines the importance of the text in relation to the corpus of Judeo-Portuguese texts and to the history of Hebrew book illumination. Some years later Moreira de Sá reviewed the text transcribed by Blondheim. More recently, an extensive study on the language of the Livro das Cores was undertaken by Devon Strolovich. In addition to being the only Portuguese medieval source regarding colour preparation, the Livro das Cores is a key text to the study of Judeo-Portuguese and one of the oldest examples, even though it does not show a particularly strong Jewish influence. Strolovich’s work examines the strategies of adaptation of the Hebrew characters in the representation of medieval Portuguese, and he suggests that such adaptation is neither derivative from the Latin notation nor entirely dependent of the conventions of written Hebrew. Also, it is not an individual adaptation of one writer and it is not particularly influenced by oral language.

Strolovich rejects the idea that the articulated language in this writing system has a Jewish intrinsic character, even though he does not exclude such possibility. The only Jewish aspect of the text is the Hebrew notation interpreted as a symbol of the well-adjustment of the Portuguese Jews in the linguistic community. Strolovich underlines that Judeo-Portuguese indirectly captured the Portuguese language in a state still recent of its history and, simultaneously, the sociolinguistic situation of the Portuguese Jewish community.

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38 Afonso, New Developments in the Study of O Livro de Como se Fazem as Cores.
39 The Livro das Cores has been translated into English (Blondheim, 1928; Abrahams, 1979; Strolovich, 2005); Portuguese (Moreira de Sá, 1960); Italian (Bernheimer, 1924 some excerpts); and Spanish (Espinosa Villegas, 1996).
41 Strolovich, Old Portuguese in Hebrew Script.
43 Strolovich, Old Portuguese in Hebrew Script.
3. Research questions

Considering both the justification and the background of our research, we now propose to focus our study in three main questions that are necessarily unfolded into several other secondary questions:

3.1. *What are the historical circumstances surrounding the production of Hebrew manuscripts in Portugal in the second half of the fifteenth century and, consequently, of the Ms. Parma 1959?*

This broad question must be addressed taking into account the following secondary questions: (1) what was the general situation of the Portuguese Jewish communities; (2) what was the cultural and religious environment; and (3) what was their production.

In addition, it must be determined which features of the Ms. Parma 1959 allow us to establish a direct relationship with other Portuguese Hebrew manuscripts. Hence, it must be considered: (1) the texts included; (2) other para-textual elements such as the main codicological and palaeographical features; and (3) what are the iconographic elements included in the volume.

3.2. *Which features of the Ms. Parma 1959 associate it to the illumination of Hebrew manuscripts in Portugal, that is, what is the “audience” of the Ms. Parma 1959?*

In order to answer this question it is necessary to establish what are the main features of the Portuguese Hebrew manuscripts, especially those with illumination. Furthermore, it must be determined what are the main reasons underlying the assembly of a miscellaneous (though most likely homogenous) volume such as the Ms. Parma 1959, that is, it must be established whether there was or who was the “audience” of the volume. This question must be addressed with the philological study of the texts included in the Ms. Parma 1959, which will also allow us to assess any direct and indirect connections with the production of Hebrew sacred texts in Portugal. Consequently, the Ms. Parma 1959 needs to be evaluated in all possible angles, that must include a codicological and palaeographical study and the analysis of any iconographic elements.
3.3. To what extent is the Livro das Cores directly associated with the illumination techniques used in the Portuguese Hebrew manuscripts and what is its relationship with the non-Jewish manuscripts?

The third and last question implies the assessment of the most important features of the Livro das Cores such as its originality. The text must be viewed in the context of medieval technical texts, particularly in Portugal and Spain. Also, the language employed must be analysed. In addition, the text itself must be studied in order to determine its connection with both Jewish and non-Jewish manuscript illumination. Although the text does not present any particular Jewish traces, it is written in Hebrew script and included in a Hebrew volume, and this must be considered as an indication of a relationship with Hebrew manuscripts. On the other hand, the already proven relationship with Portuguese (non-Jewish) manuscripts raises the possibility of an exchange of knowledge between the two groups of the Portuguese society.

4. Research structure

In order to fully address these questions, we have divided our dissertation in three main parts: Part One is entirely dedicated to the context of the Ms. Parma 1959. On chapter 2, we propose an outline the main historical circumstances encompassing the fifteenth-century Portuguese Jewish community, and the evaluation of the cultural (and intellectual) environment pertaining to the production of Hebrew manuscripts in Portugal. In relation to this, we assess the production of Jewish works in Portugal and enlist the main themes of Jewish medieval production.

This chapter is followed by a characterisation of the general material codicological and palaeographical features of Hebrew manuscripts, as well as their binding and other general characteristics (chapter 3). In this chapter we determine the main geo-cultural divisions of Jewish cultural production, particularly focusing on the Sephardic region and more specifically in the Iberian Peninsula.

Chapter 4 is dedicated to the description of the main features of Sephardic manuscript illumination, with particular emphasis on the Castilian school and its connection to Portugal. We finish by describing the main iconographic features of Hebrew manuscripts decorated in Portugal. We raise some initial questions of a possible influence of Christian manuscripts in the Portuguese Hebrew manuscripts.
The second part of our research (Part Two) is entirely dedicated to the Ms. Parma 1959, that is analysed in four different perspectives: on chapter 5 we proceed to study of each philological unit comprised in the volume, in order to establish any textual connections with the production of Hebrew manuscripts in Portugal, both in terms of book decoration and contents.

Chapter 6 is concerned with the main codicological features of the Ms. Parma 1959, in order to determine the date of its writing and to establish the process of compilation. This chapter is closely associated with the next chapter (chapter 7), where we analyse the palaeographical particularities of the manuscript and evaluate the number of hands participating in its copy. Our analysis of the Ms. Parma 1959 is mostly based on the photographs of the entire volume that were provided by Prof. Dr. Luís Urbano Afonso. The palaeographic elements were evaluated with the help of OCR (Optical Character Recognition) software, more specifically, the tools provided by the Gamera Project44.

We finish our analysis of the Ms. Parma 1959 with the evaluation of the few iconographic elements found in the Ms. Parma 1959 (chapter 8). One sketch in particular may suggest some connection with the typical binding of a few Portuguese manuscripts and with the Kennicott Bible.

The third and last part of the dissertation (Part Three) deals with the Livro das Cores. We begin on chapter 9 with the appraisal of the Livro das Cores in the context of medieval technical texts dealing with colour preparation, assessing its contemporary texts particularly in the Iberian Peninsula, so as to establish any possible direct sources underlying the text of the Livro das Cores.

On Chapter 10 we evaluate one of the most important features of the Livro das Cores, that of the combination of the Portuguese language with Hebrew script, and all the subsequent questions surrounding it. We consider them in the context of Judeo-Portuguese and we compare it with other texts. Our study of the transliteration system allowed us to read, transliterate and translated the additional recipes included in the Ms. Parma 1959, that are written in Portuguese, despite being described as Spanish45.

Following the determination of the linguistic context in the previous chapter we provide the analysis of the text of the Livro das Cores on chapter 11. We especially evaluate the aljamia nature of the text and we consider some of the linguistic specificities.

44 http://gamera.informatik.hsr.de/addons/ocr4gamera/index.html
45 Richler and Beit-Arié, Hebrew Manuscripts in the Biblioteca Palatina in Parma, 473.
Finally, on chapter 12 we describe our analysis of the recipes included in the text, considering the intended results and the procedures described and suggested materials (as well as the specificities of some of the recipes).

5. Research merit and impact

The main merit of our research is the fact that this is the first extensive study on the Ms. Parma 1959 and one of very few on Portuguese Hebrew production. Though initially based in previous researches (that generally evaluate the Ms. Parma 1959 in the context of the Livro das Cores), we believe to have significantly contributed to the study of a manuscript that is part of a broader history: the history of the Portuguese manuscripts. In fact, in our research, we not only take into account the Jewish context, but we also approach the Ms. Parma 1959 in the context of the general and comparative study of contemporary manuscripts, which are the key elements to a full analysis.

In addition, the main research questions we propose have never been fully answered, although they are essential to subsequent studies on Portuguese Hebrew book production. We thus provide a broad analysis of all the elements necessary to address the question of whether there is a connection between Hebrew illumination and the Ms. Parma 1959. There is a complete absence of studies in Portugal regarding Hebrew manuscripts and Hebrew book illumination. In our dissertation, we describe the main features of Hebrew manuscripts, which will undoubtedly contribute to further studies on the Portuguese manuscripts. We review the main iconographic features of the Portuguese manuscripts and we consider the Livro das Cores in the context of book illumination in Portugal.

Hence, this research can be considered as the first Portuguese study in the field of Hebrew book illumination. We believe that the main impact of our research will be the incentive given to this particular area of studies dealing with the Portuguese and Jewish cultural (and artistic) legacy.
PART ONE

The Context of the Ms. Parma 1959
The Ms. Parma 1959 is not an isolated attestation but rather a remarkable example of cultural, artistic and scientific production of Portuguese Jewry. In this chapter, and to fully appraise it in the context of Hebrew manuscript production in Portugal, we propose an evaluation of the historical and cultural environment pertaining to their production. We begin by outlining the main circumstances encompassing the Portuguese Jewish community in the fifteenth century, followed by the evaluation of the Jewish religious and cultural environment in Portugal. We review the concept of Hebrew and/or Jewish book and we outline the main categories of Hebrew texts. Finally, we assess the production of Jewish works in Portugal so as to determine the background of the Ms. Parma 1959 and Portuguese Hebrew manuscripts in general.

1. Jewish communities in Portugal in the fifteenth century

Estimates suggest that by the end of the fifteenth century between three percent and ten percent of the population in Portugal was Jewish⁴⁶. No doubt, this was greatly due to the consecutive waves of anti-Semitism across Europe⁴⁷, particularly in the Iberian kingdoms (Castile, Aragon, Navarra, etc.). Fourteenth and fifteenth centuries witnessed a great influx of Spanish Jews into Portugal due to consecutive pogroms that culminated in their definitive expulsion from Spain in 1492. The Portuguese king D. João II allowed them to enter the country under the payment of eight cruzados for each person (which was already an impressive amount) and under the condition that they would not stay longer than eight months⁴⁸.

⁴⁶ Maria José F. Tavares suggests that only 3% of the total population was Jewish: Os Judeus em Portugal no século XV (Lisboa: Universidade Nova de Lisboa, 1982), 74, whereas J. Lúcio de Azevedo’s estimates that 10% of the population was Jewish: História dos Cristãos Novos Portugueses (Lisboa: Clássica Editores, 1975), 43.

⁴⁷ European Jews were constantly forced to escape persecution (motivated by the Crusades or inflammatory local speeches) or expelled: in 1290, they were banned from England; in 1396, 100,000 Jews were expelled from France, and in 1421 from Austria.

Figure 2.1. Jewish communities in Portugal in the fifteenth century

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49 Image adapted from Maria José F. Tavares, A Herança Judaica em Portugal (Lisboa, CTT, 2004), 76.
Despite the impact of Spanish Jews in the growth of the Jewish communities in Portugal in the late fifteenth century, it is possible to ascertain the presence of Jewish communities in Portuguese territory since the fourth century⁵⁰. Usually organised in a separate space such as a whole neighbourhood or a single street, there are several examples of coexistence with the Christian majority, especially if there was not the necessary quorum for the synagogue services.

The influx of Spanish Jews into Portugal had great impact on the urbanisation of smaller cities and villages. As shown in figure 2.1., by mid-fifteenth century there were 135 Jewish communities settled across the country⁵¹, mostly concentrated in the borders and in centre.

Each community was locally governed by a rabbi with religious, administrative and judicial authority. Jewish communities were divided in seven rabbinites: Santarém, Viseu, Covilhã, Porto, Torre de Moncorvo, Évora and Faro. The rabbi-in-chief, who was the highest figure in the Jewish hierarchy, was usually a counsellor of the monarch, and frequently his doctor. In the cities with the largest communities such as Lisbon, Évora and Porto, there were more than one enclosed Jewish quarter with all the needed services such as one or more synagogues⁵², hospital (and leprosy house), prison, school, slaughter house, bath house, etc. Jewish cemeteries were usually outside the Jewish quarters.

Figure 2.2. Approximate location of the three Jewish quarters in Lisbon in the fifteenth century⁵³

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⁵² In each city, the number of synagogues varied according to the size of the community, and does not exclude the existence of synagogues outside the Jewish quarter, as was the case in Porto, where there was a synagogue near the port and commercial area, whereas the Jewish quarter was located further up the hill of the Olivais.

⁵³ The picture of the city of Lisbon in the sixteenth century by Georg Braun and Franz Hogenberg.
In Lisbon, due to the significant number of Jewish inhabitants, there were three Jewish quarters, figure 2.2: (i) the Large Jewish Quarter, the oldest and most important; (ii) the Alfama Jewry; (iii) and the Small Jewry also known as Taracenas or New Jewish Quarter.

In the Large Jewish Quarter there were at least three synagogues. One of them, the Main Synagogue, is described as having three aisles and special chairs for distinguished families such as Negro, Abravel, and Nacim. From this synagogue there is a single epigraphic record currently kept at the Tomar synagogue, as nothing else survived the earthquake of 1755. Our knowledge on the Main Synagogue is mostly based on the description of a German doctor, Jeronimus Muenzer, who visited Portugal in 1494.

In the capital lived some of the most influential families such as the Negro (or ibn Yachia or Yahia), Navarro, Palaçano, Gabay, Latam, Faiam, Vizinho (or Vecinho), Toledano and Abravel. These families belonged to a political and economic elite and worked with international commerce and banking activities, frequently financing the Portuguese Crown. However, the majority of Portuguese Jews were low-profile merchants and artisans, and a small percentage worked in agriculture and with livestock. In the cities, crafts were usually organised in a specific place, with streets devoted to specific activities; other times, they worked among Christians in the main places of the city.

While in the smaller communities synagogues also functioned as schools, courts and assembly house, in larger communities such as in Lisbon, schools had their own buildings. There are records of several religious and secular schools in Lisbon and it is possible that in one of them functioned an organised centre for the copy and illumination of manuscripts. This question remains unsolved, although all Portuguese Hebrew manuscripts share common features and those with colophon indicate that they were illuminated in Lisbon.

The second largest community was located in Évora, where there were at least two synagogues (the Old Synagogue and the Large Synagogue), as well as a hospital and more than one school. After 1492 Évora sheltered a large group of Castilian Jews. Here lived some of the most distinguished Portuguese Jewish families such as the Navarro, Abeacar (or Beacar), Benafacam, Caro and Vivas. It should be noted that the surname “Vivas” is one of the possible

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54 Tavares, As Judarias de Portugal, (Lisboa: CTT, 2010), 33-34.
55 António Ribeiro dos Santos makes reference to a school, an important Talmudic centre, where the mainstream texts were copied and illuminated: “Memórias da Literatura Sagrada dos judeus portugueses no século XVII.” Memórias da Literatura Portuguesa publicadas pela Academia dos Ciências de Lisboa, vols. II-IV (Lisboa: Academia das Ciências de Lisboa, 1792): 265-271. This is also mentioned by M.-J. Ferro Tavares, Os Judeus em Portugal no século XV, 1982 and by Elvira Azevedo, O Sefardismo na Cultura Portuguesa (Porto: Paisagem, 1970). Immanuel Aboab (1555-1628) in his Nomologia o Discursos Legales (1629) also makes reference to a calligraphic centre in Portugal. This reference has been used by Gabrielle Sed-Rajna to support the argument of the existence of a centre of Hebrew book illumination in Lisbon: Manuscrits hébreux de Lisbonne: un atelier de copistes et d’enlumineurs au XVè siècle (Paris: Centre National de Recherche Scientifique, 1970). It was later rebuked by Thérèse Metzger, Les manuscrits hébreux copiés et décorés à Lisbonne (Paris: Centre Culturel Portugais, 1977).
translations of “Hayyim”, the name of the author of the List of oddly shaped letters that is included in the Ms. Parma 1959, which is the only text with colophon. In this case, the use of the Hebrew version of the name must be interpreted as the result of being included in a Hebrew text. Hence, “Hayyim” may well correspond to the Portuguese surnames “Vivas”, “Vidas” or “Vidal”\(^5\). These were common names among Portuguese Jews, and there are several records of names such as Vivas, Vidas and Vidal in Évora and in Lisbon. In addition, there are several records of the name Haim (as a first name), mostly in the fifteenth century\(^6\).

After Lisbon and Évora, the third largest Jewish community lived in Porto. There are records of several consecutive Jewish quarters, and by the mid-fifteenth century the Jewish population lived within the walls of the Olivais’ Jewry (nowadays Vitória), a modern and urbanised quarter. After 1492, Porto housed thirty Spanish families, including some of the most prominent marranos (or anusim) writers such as Immanuel Aboab (grandson of Isaac Aboab), Samuel Usque and Uriel Acosta. One of the most common occupations amongst Jews in Porto was medicine, which easily explains the amount of medical texts that survived, some of them written in Portuguese with Hebrew script, as is the Thesaurus Pauperum that we will further evaluate (cf. chapter 11 § 1.3).

We would like to refer to two other locations associated with the Ms. Parma 1959. The first is Loulé, a small village in the South (in the Algarve) that is mentioned in the colophon on fol. 195v. According to Maria José Tavares, here lived a small community most likely associated with a larger one in Lagos, which was a strategic point in the Portuguese Expansion. There are no physical records of the Jewish presence in Loulé, but several documents attest their presence here\(^7\).

A second location (indirectly) associated with the Ms. Parma 1959 is Braga, in the North. At least 52 Jews\(^8\) lived here between 1466 and 1509 in two consecutive Jewish quarters\(^9\). The indirect association of the Ms. Parma 1959 with Braga is due to the suggested connection of Abraham ibn Hayyim with Joseph ibn Hayyim, the illuminator of the Kennicott Bible in La

\(^5\) The same happens with the name Sarfati, a common Jewish name meaning “French”. For instance, there are records of Jacob Francês (Tavares, Os Judeus em Portugal no século XV, 121).

\(^6\) Tavares, As Judiarias em Portugal, 69, 93, 131, 133, 284-5, 302.

\(^7\) Among them three rabbis, three doctors, four goldsmiths and two merchants and a few women with social distinctions: António Losa, “Subsídios para o estudo dos judeus de Braga no século XV” in Congresso Histórico de Guimarães e sua colegiada, 5 (1982): 97-126.

\(^8\) There are several physical testimonies of the Jewish community in Braga such as an inscription that was studied by Geraldo Coelho Dias: “Uma reliquia epigráfica dos Judeus de Braga”, in As religiões da nossa vizinhança (Porto, Faculdade de Letras da Universidade do Porto, 2006), 207-222.
Coruña, Galicia. There are other elements that may link this well-known Bible to Portugal: the fact that the recipient was the son of D. Solomon de Braga (most likely from the Portuguese city) and several material aspects such as the binding (cf. chapter 3 § 4 and chapter 8 § 2).

Generally speaking, the Jewish community was well established in Portugal, especially when their situation in Portugal is compared to the anti-Semitism felt by other Iberian communities throughout the fifteenth century. Despite the occasional (and local) conflicts, Jews were tolerated by the Portuguese majority. Their contribution to the Portuguese Discoveries was crucial, especially in the financing of expeditions and, to some extent, in terms of scientific knowledge.

The Jewish contribution to the literary and philosophical activities in Portugal was equally significant (cf. § 5). Still, it is striking the lack of studies of the intercultural relationship between the Christian majority and the Jewish minority in terms of artistic development. It is yet to be assessed to what extent there was a mutual influence, perhaps even cooperation similarly to what happened in many other countries, or what is the impact of Portuguese manuscripts and book illumination in the Hebrew manuscripts.

2. Religious and intellectual environment

Regarding their religious and cultural life, the Portuguese Jewish communities were completely dependent on the other Iberian communities. Until the mid-fifteenth century, the Iberian Peninsula enjoyed what is known as a “Golden Age” of Sephardic Judaism, even though there are no significant Portuguese thinkers or religious authorities before the second half of the fifteenth century. Those frequently associated with Portugal such as Isaac Abravanel are usually prolific authors only after they leave the country (cf. § 5).

Yet, by the second half of the fifteenth century Portugal becomes the most important (and virtually the only) religious and intellectual Sephardic centre. This was chiefly due to the immigration of important Sephardic religious and intellectual figures such as Isaac Aboab.


62 As an example, the research conducted by Sarit Shalev-Eyini, from the Hebrew University in Jerusalem, on a corpus of Hebrew manuscripts from Lake Constance. Shalev-Eyini was able to conclude that there was a surprising cooperation between Jews and Christians in local workshops that was reflected in the iconography. Curiously, the name of the main scribe that was studied is Hayyim. Sarit Shalev-Eyini, Jews among Christians. Hebrew book illumination from Lake Constance (Turnhout, Belgium: Harvey Miller Publishers, 2010).
Abraham Zacuto, etc., but also due to the scientific knowledge and amount of works brought with them. Religious teaching was compulsory to all Jewish males, who were taught how to read and write in Hebrew. They should also be knowledgeable in the Talmud and other religious texts that were studied individually or in schools known as bet ha-midrash.

In larger communities such as Lisbon there was more than one school. According to Ferro Tavares there are records of a bet ha-midrash, also known as the school of Rabbi Eliezer, and an academy known as Estudo de Palaçano, both in the Old Jewry. Initially intended for rabbinic studies, it is most likely that the Estudo de Palaçano also served as a secular school.

There are very few records of university attendance and only the children of the most important families had formal education. Most children and young people learned with tutors and the trades were passed on from father to son. The most important medieval academic secular centre was the Estudo de Palaçano. Here, along with religious studies, were taught secular subjects such as sciences, astronomy, cartography, medicine, and mathematics.

According to the records, the Estudo de Palaçano was located in front of the main synagogue, and in the back or next to it there was a library (or a place for book dealers). Lisbon benefited greatly with the influx of books brought by the Castilian Jews, some of them

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61 One direct consequence of the scientific knowledge of the Spanish Jews was the introduction of the printing press. For more information on this subject see: Artur Anselmo, Les origines de l'imprimerie au Portugal. Paris: École Pratique des Hautes Études, 1983.

62 “Próximo destas casas de Abravanel ficava um Midrash, uma escola, na rua do Poço da Foteia que tinha uma porta no beco onde ficava a cadeia. Era constituído por uma loja com um póto e três sobrados sobrepostos, um deles por cima de uma das casas téreiras da cadeia.” In Tavares, As Judarias de Portugal, 61.


64 Guedelha Palaçano, born in c. 1390, was the rabbi-in-chief during the kingdom of king D. Afonso V. Guedelha was one of the most prominent Jews. He may have written an astronomical treatise now lost.

65 “Edificio de dois pisos e de várias salas téreiras e sobradadas, num total de doze, além de dois pátios interiores, ocupa uma área de 202m², aproximadamente, para o primeiro piso téreo. Aqui estuda-se e discut-se o Talmud e os comentadores rabínicos, além de outras ciências.” in Tavares, Os Judeus em Portugal no século XV, 369.

66 Abraão Ibn Yakia, the rabbi-in-chief and also the doctor of King Afonso V, studied in Coimbra and so did his son Guedelha (Tavares, Linhas de Força da História dos Judeus, 456).

67 Tavares, Os Judeus em Portugal no século XV, 230.

68 Ibid.

69 The maps taken by Pero da Covilhã and Afonso de Paiva in their excursions were prepared by three Jews: Mestre Rodrigo, Mestre José (also a doctor) and the German Martin Behaim. The three scientists developed some of the most important maritime navigation instruments and prepared tables of the sun (Azevedo, O Sefardismo na Cultura Portuguesa, 75).

70 Medicine, in particular surgery and ophthalmology, was a common occupation among Portuguese Jews.

extremely valuable. According to a testimony of a converted Jew, they were worth c. 100 000 cruzados, that is, 39 000 000 reais. King D. Manuel would sell them for two or three cruzados, that is 780 000 to 1 170 000 reais:

“decrarey entam porque me foy dito que sua alteza dava toda a livraria de letra judaica por ii ou iii cruzados e porque eu sey quanta livraria estava aqui de Castela e a sua valor sendo causa que ditirminase de os vender pera tirar cativos o (sic) em syrviço de Deus pois que ha antre judeus muitos livros que renderiam mais que çem mil cruzados douro...”


In Judaism, books as material objects have had a pivotal role in the preservation and transmission of the Mosaic Law. After the destruction of the Second Temple in Jerusalem and the consequent diaspora of the Jewish people, books were the preferential means to “disseminating and propagating the religion, traditions and values to the dispersed Jewish people.” The copy of religious texts was considered a mitzvah, that is, a commandment, and their embellishment not only was permitted but also encouraged. In fact, the decoration of books was practically the only form of artistic expression throughout a significant part of the history of Jewish art. The decoration of Jewish books normally reflects local tastes and dominant trends, whereas their production and copy involves specific rules, most of them exclusive to Jewish books. Books brought with Spanish Jews must have been a reflection of the predominant taste and must have included religious and secular works. These last ones were the less prone to be destroyed and more easily incorporated in Christian libraries unidentified.

Hebrew books and Jewish books do not necessarily coincide. Jewish ideas are not limited to texts written in Hebrew, and Hebrew texts are not necessarily reduced to Jewish ideas. There are many works preserved in Hebrew that are the product of specific circumstances, and they are not specifically Jewish but rather an integral part of the mental universe of medieval Jews. No doubt, it may be difficult to ascertain what is original and what is imported into the Jewish thought. Thus, the most accurate definition of “Jewish text” is that it is accepted and transmitted by the Jewish communities.

The social circumstances of Hebrew book production are different from other cultures due to general literacy and the lack of political power and organisation (the result of the vast

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74 Tavares, Os Judeus em Portugal no século XV, 370.
75 A.N.T.T., Corpo Cronolóxico, Part 2, m. 241, doc. 54, apud Tavares, op. cit., note 151.
77 Colette Sirat, Hebrew Manuscripts of the Middle Ages (Cambridge: Cambridge University Press, 2002), 95.
dispersion over different political entities). Hebrew books were privately and individually consumed, and they were made by either professional or semi-professional scribes commissioned, or made by users themselves. Books were not produced in scriptoria nor by commercial teams of scribes, but rather made by single scribes or scholar-copyists assisted by members of their families or by their students. Multi-hand manuscripts are less than ten percent of dated Hebrew codices and in some regions they were considered inferior. Yet, a few manuscripts were produced by students in yeshivot, who shared the copy with their master. These cases are mostly confined to the late Middle Ages and to Sephardic areas. Examples of such collective writing are the Hebr. 80° 56, 1477 (Frankfurt, Universitatsbibliothek), copied in Toledo by eight hands, although six scribes copied only small parts; Hébr. 169 (BNF, Paris); and the Ms. Parma 2372, 1467 (Parma, BPP), copied by three scribes in the yeshiva of Isaac Aboab in Buitrago. It is possible that this yeshiva copied books for external owners. We shall later discuss this in relation to the copy of Hebrew manuscripts in Portugal (cf. § 6).

4. Medieval Hebrew texts

Regardless of specific traits of each geo-cultural region and the different branches of Judaism, it is possible to observe the predominance and circulation of the following types of texts during the Middle Ages:

4.1. Bible and its study

The consonantal text of the Bible was established long before the Middle Ages, and in order to correctly read it there are several notations such as signs of cantillation and the
masorah\textsuperscript{84}. The Bible is composed of 24 books (cf. appendix A) and until the introduction of the printing press it was divided in \textit{parashiot} or \textit{sidrot}, that is, portions of readings. The only exception is the book of Psalms which has been numbered since the tenth century. During the Middle Ages several types of literature were composed such as biblical translations in several languages, homilies and sermons to accompany synagogue services. Also in this category is included an impressive amount of biblical commentaries.

More than half of Hebrew manuscripts (c. 60) copied in Portugal are Bibles. The Bible is equally predominant within books with illumination, even though they are mostly incomplete Bibles (cf. chapter 4 §4).

\textbf{4.2. Legal texts}

The most important legal text is the Talmud, which was written around the eighth century. The Talmud consists in the \textit{Mishnah} (in Hebrew) and the \textit{Gemara} (Aramaic and Hebrew), essentially a commentary to the \textit{Mishnah}. The rabbinical \textit{responsa} to the oral law codified in the Talmud was a particularly common way to study the Talmud, and parallel sources to a specific point became progressively more common. These writings became the centre of Rabbinical tradition.

\textbf{4.3. Prayers and liturgical poetry}

Jewish liturgy in Portugal followed the Sephardic rite. Progressively, benedictions and prayers were formalised, and from the seventh century onwards liturgical poems (\textit{piyyutim}) were added to or replaced the ordinary prayers. After the thirteenth century the \textit{siddur} (book of prayers) was introduced. There are several extant copies of \textit{siddurim} and \textit{mahzorim} (sing. \textit{mahzor}) from Portugal\textsuperscript{85}.

The \textit{siddur} is a compilation of the year’s prayers for week days, Shabbat, holy days, etc. In the history of post-Talmudic liturgy, there are three important moments: (1) the \textit{siddur} of Amram Gaon (ninth century), the first complete liturgy for both the synagogue and daily life, and the normative text for most rites. It is generally known as \textit{Seder Rab Amram}, even though it might have been written by Amram’s students, and there are several later interpolations; (2) the \textit{Seder Tefilot kol ha-Shanah}, written by Moses Maimonides. It is included at the end of the

\textsuperscript{84} The \textit{masorah}, in a broad sense, is the precise vocalisation and accentuation of the biblical text with diacritic markings and concise marginal notes. These notes give the accurate spelling of words.

\textsuperscript{85} For the complete list of Portuguese manuscripts, see appendix B § B.1.
second book of the “Yad”, and it is identical to the Sephardic minkhag; and (3) the Makhzor Vitry, compiled and written by Simkha b. Shmuel of Vitry, one of Rashi’s students. It is the basis of the Ashkenazic tradition.

4.4. Secular literature

Most of the literature written in the Middle Ages had a didactic and moralising intention. In addition, there were several poets of the court in Muslim Spain (Moses ibn Ezra, Ibn Gabirol, and others). In this category are also included grammars, dictionaries and glossaries. Grammar was a normative discipline whose rules are expressed in the biblical text; dictionaries by roots were used until the birth of modern Hebrew; glossaries gave translations and comments following the order of the text. Grammars and lexicons were also copied in Portugal.

4.5. Mysticism (and Kabbalah)

There are Jewish mystic writings at least since the Byzantine period. The mystical current continued in the East and in Germany, and originated the Kabbalah first in Provence and after in Spain. In Girona, Moses ben Nahman (Nahmanides) developed the kabalistic ideas. Kabbalistic writings were often in the form of exegetical texts, although they were not always accepted. The most common text was the Zohar. There are some Portuguese manuscripts concerning these subjects. Among the Portuguese kabbalists was José Zarco (a doctor) and Moshe be Shem Tov.

4.6. Philosophy and science

Jewish philosophy was initially marked by Hellenism and later developed under Muslim influence. In the Middle Ages, Aristotelianism was dominant (Maimonides clearly was the prime representative of Aristotle in the Middle Ages) and, to a lesser extent, Plato. Jewish literary and scientific production was generally written in Arabic or in Hebrew. Medicine was one of the most practised sciences throughout the Middle Ages and beyond. Astronomy and astrology were equally common activities. Regarding Portuguese Hebrew manuscripts, scientific subjects were quite common. An interesting feature of this group is that it includes several scientific texts that were written in the vernacular (Portuguese) and transliterated with Hebrew script.
4.7. Miscellaneous writings

Finally, this last category brings together all other types of composition such as letters, documents, lists, tables, indexes, recipes and compilations of extracts on various themes. This is particularly important to our study, as the Livro das Cores seems to be a compilation of recipes and the Ms. Parma 1959 regarded as a miscellaneous volume.

Composite or miscellaneous volumes include notebooks containing annotations and texts that passed from hand to hand, enlarging as each owner added his own contribution. Another type of composed text is that done by a single reader, who groups a number of pre-existing texts, to which he may add his personal commentaries and corrections (usually in the margins), organise the material and compile a table of contents. Usually these volumes have a particular subject, but most often they are heterogeneous collections. Colette Sirat explains that “some volumes were made up when they were bound for Christian libraries, the only criteria being size (folios that did not fit the format being trimmed for the purpose)”86. Finally, calendars and astronomical tables are common, but they usually are incorporated in other texts, such as prayer books or other religious texts.

5. Jewish production in Portugal

Intellectually speaking, the Jewish minority in Portugal was well-assimilated. This is seen, for instance, in the active participation of a Jewish elite in the court of the king. Their contribution to Portuguese and medieval Iberian literature is still to be fully appraised. Still, there are a few known fourteenth century troubadour poets such as Samuel de Alcobaça (or Leiria), Vidal de Elvas87 and Judas Negro, a poet in the court of Queen Filipa de Lencastre. These poets were part of the Galician-Portuguese troubadour poetry. In addition, it is known that there was a Hebrew translation of the Cronica Geral de Espanha, which is now lost.

Fifteenth century is quite rich in terms of cultural activity. Juridical, philosophical and religious works. Sadly, there are no extant Portuguese copies of the majority of these texts, and they are mostly known through their reproduction in the Diaspora. Some were written by members of distinguished families such as the Ibn Yakhia (also known as Negro), the Navarro and the Abravanel family. Originally from Seville, the Abravanel immigrated to Portugal in the

86 Colette Sirat, Hebrew Manuscripts of the Middle Age, 95.
87 There are two songs are attributed to Vidal, a Jew from Elvas. One of them is part of the Cancioneiro da Vaticana: M.-J. Ferro Tavares, “Linhas de Força da História dos Judeus em Portugal das Origens à Actualidade”.

26
end of the fourteenth century. They belonged to the intellectual Portuguese elite, and particularly Isaac Abravanel was knowledgeable in Latin, Greek, Spanish, Portuguese and Hebrew. He wrote several Biblical commentaries such as Tsriot Hayessodot, Shevet Yehudah, Mahaseh Shadai. Also, the Hebrew Bible kept at the Biblioteca Geral da Universidade de Coimbra is known as the Abravanel Bible, and it most likely belonged to Isaac Abravanel, who is known for having an impressive library that was later confiscated by the Crown. Another well-known fifteenth-century name is José Zarco who was a doctor and probably the same person as José ibn Shraga. Zarco is known as the “Agrigento Kabbalist” due to the kabbalistic commentaries written by him and for later in his life escaping to Agrigento. Also, Salomão son of José Negro is the author of Shalshelet ha-Cabala, a text written in Lisbon (written c. 1300)88.

There was also a great interest in grammar. There are several copies of David Kimhi’s works, both manuscripts and incunabula. For instance, one of the texts included in the Ms. Parma 1959 is Kimhi’s Sefer ha-Mikhlo. In Portugal, David Yakhia (1455-1528), son of Solomon Yakhia Lisbonense also composed a grammatical treatise entitled Leshon Limmudim, published in Constantinople and in Venice; also, Kav ve-Naki, a commentary on the Mishnah, Shekel ha-Kodesh, on the rules of Hebrew poetry, Tehilah le-David, a commentary on the Psalms, among other works89. Another David Yakhia (1465-1543), son of José Yakhia, was the author of Epitome Grammatical.

Another Portuguese author was Moshe ben Khabil ben Shem Tov. He is the author of three important works: Darce Noham (“Delightful Ways”), Marphe Leshon (“Medicine of the Language/Tongue”) and Perach Susan (“Lily Flower”). Shem Tov, who was from Lisbon and a member of the Lisbon Academy, is also the author of a commentary written in Naples entitled Bekhinit Olam, where he refers to himself as being part of the “Holy Synagogue of Lisbon in Portugal”.

Other frequent subjects were scientific works, especially medicine, a common occupation among Portuguese Jews91. David Yom Tov, who lived in c. 1320, was a doctor and an astrologist who wrote a medical and astrological treatise. He is also the author of a philosophical treatise about the origins of the world, the Yesodot ha-Maskil92. There are records of books about meteorology, astrology, atlas, etc. Of the extant Portuguese Hebrew manuscripts, ten percent are scientific texts. Also, the only non-religious incunabula prepared

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88 M-J. Tavares, A Herança Judaica em Portugal, 134.
89 Santos, Memorias da Litteratura Sagrada, 254.
90 Azevedo, O Sefardismo na Cultura Portuguesa, 77.
91 There were thirty-eight doctors in Lisbon and twenty-four surgeons; in Porto, over thirty doctors and five surgeons: Tavares, Os Judeus em Portugal no século XV, fig. 24.
by Jewish printers were Abraham Zacuto’s astronomical tables, the Almanach Perpetuum. Some of these scientific texts were written in Portuguese with Hebrew script. This is not unusual, as King D. João I (d. 1433) forbade the use of Hebrew in official documents, and most male Jews were literate in both Hebrew and Portuguese.

In general, the most common situation was the copy of widely known texts such as Maimonides’ Mishne Torah and other authors from the Sephardic Golden Age. Jewish-Portuguese intellectual life undoubtedly mirrored Sephardic culture, and the intensive cultural production in the last half of the fifteenth century was much due to the influence of Spanish Jews combined with the introduction of new technologies such as the printing press. Notwithstanding the supremacy of Spanish culture, this does not necessarily imply the inexistence of a national production, and we must underline the scarcity of sources and studies on the Jewish-Portuguese production.

Despite all activities concerning the copy and illumination of Hebrew manuscripts, after 1482 Bibles and other religious books began to be printed. The first Portuguese incunabula are in Hebrew, and the oldest was printed in Faro by Samuel Gacon. A few years later, Eliezar Toledano printed several books in Lisbon. Some of his incunabula have handmade decorated frames, similar to the ones of known manuscripts. Leiria was the third and last printing centre. Here were printed Abraham Zacuto’s astronomical tablets, that was considered at the time as an important resource to navigation.

6. Copy of Hebrew manuscripts in Portugal

Currently, there are c. 60 known medieval Hebrew manuscripts associated with Portugal (cf. appendix B). The majority of manuscripts were copied in the second half of the fifteenth century. There are only two known manuscripts from the thirteenth century, four from the fourteenth, the same amount for the first half of the fifteenth century, and 48 manuscripts were copied in the second half of the fifteenth century.

There is no direct evidence that these manuscripts were copied in the same institution. In fact, and contrary to Latin and Greek manuscripts, medieval Hebrew manuscripts were not produced in institutionalised centres for copying books, nor stemmed from large-scale commercial production and distribution of hand-written books which employed large teams of
scribes. Hebrew manuscripts were produced by single professional scribes or by learned men who copied texts for themselves.

Yet, several features of the Portuguese illuminated Hebrew manuscripts seem to point to an exception in the history of Hebrew book illumination. The first indication is the continuous reference to Lisbon and to a very specific period, the second half of the fifteenth century. More importantly, the employment of consistent iconographic programmes and decoration techniques, which may point to the use of the same stencils.

As for themes, there is a clear predominance of biblical texts and commentaries (more than 50 percent). The second most common type of texts are siddurim and mahzorim (liturgical texts), followed by scientific works.

<table>
<thead>
<tr>
<th>Bible (commentary and text)</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammar and lexicons</td>
<td>3</td>
</tr>
<tr>
<td>Sciences</td>
<td>6</td>
</tr>
<tr>
<td>Halakhah and midrash</td>
<td>4</td>
</tr>
<tr>
<td>Philosophy and Kabbalah</td>
<td>2</td>
</tr>
<tr>
<td>Liturgy</td>
<td>7</td>
</tr>
<tr>
<td>Literature and Poetry</td>
<td>1</td>
</tr>
<tr>
<td>Miscellaneous/Compilations</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58</td>
</tr>
</tbody>
</table>

Figure 2.3. Types of Hebrew manuscripts copied in Portugal

This group of extant medieval Hebrew books raises several important questions to which there is no straightforward answer:

(1) How do we know about the works kept in the personal libraries of the most distinguished Portuguese Jews if there barely are extant copies?

(2) More importantly, to what extent do known manuscripts reflect the type of books circulating in Portugal in the fifteenth century?

(3) Finally, do they reflect the predominant artistic taste?

Regarding the first question, the aforementioned works are mostly known through old catalogues and some printed versions. Most likely, the large majority was destroyed or


94 We have opted to exclude two manuscripts: M-FA-14, from the Biblioteca Municipal do Porto and the Vat. ebr. 372, since we only came across their references in a posterior moment of our research and they are yet to be fully studied.
incorporated into Christian libraries. After 1496 the Portuguese Crown confiscated all Jewish patrimony that included houses, gold, silver and jewellery, clothes (silk and embroidered) and books\textsuperscript{95}. King D. Manuel forbade the exit of books and ordered the destruction of a significant amount of books, selling them for low prices and offering them, especially in India. These books were to be recycled and their materials subsequently used. Years later, a similar situation occurred under the orders of the Inquisition\textsuperscript{96}. In fact, some years before, and due to political circumstances, the library of Isaac Abravanel had been confiscated by the king and sold. This library has been described as one of the richest medieval personal libraries and it must have contained secular and religious works of great worth, that are now lost. In addition, natural phenomena such as the earthquake of 1755 destroyed the remaining old Jewish buildings in Lisbon. Clearly, these circumstances should compel us to treasure even more the few known copies, as is the case of the Ms. Parma 1959.

In relation to the second question, we believe that the surviving copies must reflect to some extent the type of books in circulation in the Middle Ages. The majority of books in the Middle Ages were religious texts such as the Bible and copies of well-known authors. Religious works were the most desired and valued but also the most needed and copied. In subsequent moments, they would be collected by Christian scholars such as Benjamin Kennicott\textsuperscript{97} and Giovanni de Rossi (cf. chapter 1 § 2), who both gathered impressive collections of Hebrew manuscripts. Bibles and other religious texts did not function only as study books. It is not surprising to find that the most decorated books were Bibles and other religious texts such as siddurim. They were artistic objects desired by collectors and explored by artists.

Thus, and answering the third question, of the Portuguese Hebrew manuscripts, 36 have colophon, which translates itself in over 62 percent, a high percentage compared to other areas and periods. Around half of them are more or less decorated. We do not know much about their recipients and owners, since most manuscripts have belonged to more than one person. Yet, there are a few indications such as the Abravanel Bible, kept at the Biblioteca da Universidade de Coimbra, that must have belonged to the Isaac Abravanel himself or to his family. Another common recipient is the ibn Yakhia family. Even though this is not enough to conclude much about the recipients, it should noted that they must have been wealthy. These manuscripts were illuminated and written in high quality parchment, which means they were very valuable.

\textsuperscript{95} Tavares, \textit{A herança judaica em Portugal}.

\textsuperscript{96} Tavares, "LInhas de Força da História dos Judeus em Portugal das Orígens à Actualidade".

\textsuperscript{97} Benjamin Kennicott (d. 1783) was an Oxford scholar and a collector of Hebrew manuscripts.
We shall fully discuss the illumination of Hebrew manuscripts in Portugal in subsequent chapters. Still, we must underline that the time span of Hebrew book illumination in Portugal cannot be coincidental. Manuscripts were copied in Portugal prior to the second half of the fifteenth century (cf. appendix B). However, and except for the Abravanel Bible and a fragment (Ms. 343, Bugerbibliothek, Bern), all illuminated manuscripts date from a period between 1469 and 1496. Moreover, their stylistic resemblance clearly suggests a common background that is further confirmed by the manuscripts with colophon that indicate their origin to be Lisbon.

Even though little is known about the recipients of the Portuguese manuscripts, it is known a considerable number of copyists and (or) illuminators (cf. appendix B § B.2). Some were active for a short period, as is the case of Samuel Adrotil who copied and perhaps illuminated two works between 1487 and 1489; others extended their work for longer periods: Samuel ibn Musa worked in at least five biblical text between 1475 and 1496. On table 2.1. we describe the most prolific copyists/illuminators and their works. It is interesting to notice that there are historical records for the majority of their names.

<table>
<thead>
<tr>
<th>Scribes</th>
<th>No.</th>
<th>Subject</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samuel Adrotil</td>
<td>2</td>
<td>Grammar and lexicons Halakhah and Midrash</td>
<td>1487-1489</td>
<td>Lisbon</td>
</tr>
<tr>
<td>Samuel ben Yom Tov Alzaig</td>
<td>2</td>
<td>Bible-text Liturgy</td>
<td>1409-1415</td>
<td>Lisbon</td>
</tr>
<tr>
<td>Yosef ben Gedaliah Franco</td>
<td>2</td>
<td>Philosophy and Kabbalah Bible-text</td>
<td>1398-1411</td>
<td>Torres Vedras</td>
</tr>
<tr>
<td>Eléazar b. Moshe Gagosh</td>
<td>2</td>
<td>Liturgy Philosophy and Kabbalah</td>
<td>1484-1487</td>
<td>Lisbon</td>
</tr>
<tr>
<td>Samuel de Medina</td>
<td>3</td>
<td>Bible-text</td>
<td>1469-1490</td>
<td>Lisbon</td>
</tr>
<tr>
<td>Samuel b. Samuel ibn Musa</td>
<td>5</td>
<td>Bible-text</td>
<td>1475-1496</td>
<td>Lisbon</td>
</tr>
</tbody>
</table>

Table 2.1. Most prolific copyists and illuminators

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98 There a manuscript (Cod. Hebr. III-IV) prior to this date, but it was most likely copied in Spain and decorated in Lisbon around 1477 (Thérèse Metzger, Les manuscrits hébreux copiés et décorés à Lisbonne dans les dernières décennies du XVe siècle. Paris: Centre Culturel Portugais, 1977).

99 Tavares, Os Judeus em Portugal no século XV.
In the present chapter we propose an evaluation of the main characteristics of the production, copy and binding of medieval Hebrew manuscripts, considering the features of the Ms. Parma 1959 and the general Portuguese context. We thus examine the most relevant codicological traits of Hebrew manuscripts (writing materials, formats and other features). We describe the primary types and modes of writing and we characterise the main qualities of Sephardic script, where are included the scripts employed in the Ms. Parma 1959. Finally, we describe the typical Portuguese binding that has been pointed out as one of the most characterising features of Portuguese Hebrew manuscripts.

1. Main features of Hebrew books

Throughout this chapter, we will establish the following as the main features of Hebrew texts and books:

<table>
<thead>
<tr>
<th>Type</th>
<th>Format</th>
<th>Support</th>
<th>Script</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torah</td>
<td>scroll</td>
<td>parchment</td>
<td>ST”M</td>
</tr>
<tr>
<td>Mezuzah</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tefillin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Megillot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketubah</td>
<td>other</td>
<td></td>
<td>(usually in Aramaic)</td>
</tr>
<tr>
<td>Bible (Tanakh)</td>
<td>codex</td>
<td>parchment or paper</td>
<td>square</td>
</tr>
<tr>
<td>Siddur</td>
<td></td>
<td></td>
<td>usually square (or semi-cursive)</td>
</tr>
<tr>
<td>Mahzor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exegetical works</td>
<td></td>
<td></td>
<td>semi-cursive</td>
</tr>
</tbody>
</table>

Table 3.1. Main features of Hebrew texts and books
2. The material side: Codicological features of medieval Hebrew manuscripts

The idea of books as “material objects in which texts are embodied” does not necessarily apply to a specific writing media but rather to a whole variety that includes scrolls, codices and other formats. With Hebrew texts this is further translated into an intrinsic relationship between the chosen material and the intended use: large format texts such as scrolls were intended for liturgical services in the synagogue, as were megillot, whereas smaller codices were designed for personal use. Most frequently, codices bear signs of their place of writing. Clearly, the reception of traditional texts and the composition of new ones is ultimately influenced by local environment, which is particularly true in secular writings.

2.1. Writing materials

Generally speaking, late-medieval Hebrew manuscripts are similar to their Latin and Arabic counterparts. They were either written on parchment or on paper (after the seventh century papyrus almost disappeared). Yet, the preparation of Hebrew books bore significant differences.

2.1.1. Parchment

Parchment was considered superior to paper because it was more expensive and because it is the only allowed material for Torah scrolls (this still applies today). Also, parchment was more suitable for illumination and decoration. There are several types of parchment employed in Hebrew manuscripts, and the most relevant differences are related to the treatment and the appearance of the hair-side: in Sephardic parchment the rough hair-side is generally not scraped, and the grain pattern is barely visible; the flesh-side is bright. Even after the introduction of paper, Bibles and prayer books continued to be produced in parchment.

2.1.2. Paper

Parchment preceded paper (which only reached Europe in the last quarter of the thirteenth century), but it was gradually replaced by paper in other books rather than Bibles and prayer books. The increasing use of paper enabled the production of books in larger numbers.

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100 Colette Sirat, Hebrew Manuscripts of the Middle Ages (Cambridge: Cambridge University Press, 2002), 18.
Hebrew paper manuscripts do not differ from their Arabic or Latin counterparts. Paper was made from rags, and Western paper has clear and straight laid- and chain-lines, spaced evenly. From the year 1282 onwards, watermarks were included as trademarks of paper-mills. Essentially, there are two main groups of papers: (1) non-watermarked paper that includes paper manufactured in Eastern Muslim lands, Muslim and Christian Spain and Catalonia, and Italy; and (2) watermarked paper which is from the rest of Europe. Invented in Italy c. 1280, watermarks are distinctive of each paper-mill. Yet, it may be a difficult task to reconstruct the sheet of paper, and the watermarks may be caught in the stitching in the middle or cropped off at the edges, as seen, for instance, in the Ms. Parma 1959 (cf. chapter 6 § 2.3.1).

Watermarks are one of the most reliable sources to establish the date of a text. It is rare to find a manuscript with a single watermark, and the more watermarks the easier it is to determine the date. The initial analysis of the watermarks of the Ms. Parma 1959 determined that the paper used in the manuscript had watermarks from the fifteenth century, more specifically, between 1433 and 1488.

In Portugal, the first paper factory was located in Leiria, as confirmed by the privilege given to Gonçalo Lourenço de Gomide by King D. João I in 1411. Yet, for the most part of the fifteenth century it was still common to import paper from Europe. As to watermarks, there are no records of the introduction of this practice in Portuguese paper, but it most likely began with the manual fabrication of paper. Hence, the paper used in the Ms. Parma 1959 was not Portuguese.

In relation to the group of Portuguese Hebrew manuscripts, table 3.2. and figure 3.1, it is possible to assess a direct relationship between the chosen material and the nature of the subject: Bibles and prayer books are mostly written in high quality parchment; more practical subjects such as scientific works, halakhah, midrash texts and compilations are written in paper. Parchment predominates, although 12 manuscripts were written on paper, three use parchment and paper and in five manuscripts we were not able to identify the material

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101 “When they are held up to the light, the traces left by the mould can be seen: laid lines are the imprint of the brass wires stretched parallel to the long sides of the mould; chain lines are the marks of the pieces of wood parallel to the short sides of the mould.” Sirat, Hebrew Manuscripts, 107.


106 ibid.
used. We, however, assume that they were written on parchment due to the nature of their subjects.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Parchment</th>
<th>Paper</th>
<th>Parchment and Paper</th>
<th>Unknown</th>
<th>Sub-total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bible text</td>
<td>26</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>30</td>
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</tbody>
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Table 3.2. Materials used in the manuscripts associated with Portugal

![Figure 3.1. Materials used in the Hebrew manuscripts associated with Portugal](image)

**2.2. Diversity of formats**

The range of sizes and formats in Jewish books is particularly wide. In terms of size, very large books are mostly Bibles, whereas the majority of manuscripts are of medium size (4°), that is less than 250 mm high. Hebrew texts were written in a wide range of formats including scrolls, codices and other less common formats:
2.2.1. Scroll

2.2.1.1. Torah scroll

It comprises the five books of Moses, also known as Pentateuch. The Torah was reproduced both in the scroll and in the codex format. There are very few extant Torah scrolls, whereas codices were naturally more prone to survival.

The lack of exemplars and the strict observation of rules regarding the preparation and copy of Torah scrolls makes them particularly interesting. Most rules regarding Torah scrolls are compiled in the *Tiqqun Soferim*¹⁰⁷, a text from the Rabbinical period. This book has been used by Jews to prepare the writing of Torah scrolls for many centuries. It contains directions concerning the writing of particular words, calligraphic ornamentation, information about spacing and justification, the amount of letters per line, and all the necessary information for the correct writing of the scroll. The correct and detailed writing of the scroll was taken very seriously. If the scroll was not properly copied, it was considered invalid¹⁰⁸.

Torah scrolls and codices containing the Torah differ in several aspects¹⁰⁹: (i) they lack vocalisation signs and accents; (ii) they lack punctuation from one verse to the other; (iii) they include the space of four blank rows between books; (iv) textual margins are completely free; (v) there are six specific letters that must be in the beginning of the column; (vi) there are several distinctive letters with ornaments known as “taggin”. On the other hand, the layout of the text in columns, its division into *parashiot*, the specific layout of some poems¹¹⁰, the use of special letters (such as inverted letters, enlarged letters, *qere* and *ktiv*, etc.) were also adopted in codices. There are several texts included in the Ms. Parma 1959 that deal with the copy of Torah scrolls (cf. chapter five § 2.9, 2.14, 2.16 and 2.17).

2.2.1.2. Megillot

In addition to the Torah, there are five *Ketuvim* books that are written in separate scrolls: (i) Song of Songs, (ii) Ruth, (iii) Lamentations, (iv) Ecclesiastes and (v) Esther. They are traditionally grouped together. It is customary to read them (or some of them) publicly at the

¹⁰⁷ Not to be mistaken with the (other) *Tiqqun Soferim* that is the “correction of scribes”. That text describes the changes of word in the Bible so to preserve the name of God.

¹⁰⁸ Torah scrolls misspelled or not properly written were considered “pasul”, that is, invalid. The invalid pages were usually buried.

¹⁰⁹ Carlo Bernheimer, *Paleografía ebraica* (Firenze: Leo Olschki, 1924).

¹¹⁰ For instance, *Shirat ha-Yam* also known as “Song of the Sea” (Heb.: שיר ים). This is a poem in Exodus 15:1-18.
synagogue in specific moments in the Jewish year. Whilst the Torah is read each week, the five megillot are read (more specifically, they are sung) in festivals.

2.2.2. Codex

The vast majority of medieval Hebrew books are codices. Even though there was some resistance to the format, codices began to be used in Europe after 1050; in the Iberian Peninsula its use is only known in the twelfth century. Hebrew books were written in the same materials as other books of the surrounding cultures. The oldest surviving codices are Bibles, but there are other types such as haggadot, siddurim, and makhzorim.

2.2.3. Other formats

Other important types of Hebrew texts that are written in specific formats include mezuzot (small texts attached to door-posts), ketubbot (marriage contracts, usually highly ornamented\textsuperscript{111}), written in Aramaic, and tefillin (prayers inside small boxes then attached to the head and arm while praying).

2.3. Other codicological features\textsuperscript{112}

Among the codicological features usually pertained to Hebrew manuscripts, the following are those considered more relevant to their study:

2.3.1. Ruling and page layout

Ruling techniques vary according to the instruments employed, the ruling unit and the side of the sheet of the leaf. Instruments typically used in Hebrew medieval manuscripts were the hard point (the oldest instrument), lead pencil, pen-and-ink (in later periods), and a ruling board known as mastara, which is an instrument of Arabic origin.

Sephardic paper manuscripts were essentially ruled with a hard point, leaf by leaf, usually on the verso side. Pricking is not applied in ruling paper manuscripts, but ink dots are common in paper manuscripts. In the late Middle Ages, and in paper manuscripts, only the

\textsuperscript{111} About the ketubbah, we suggest the reading of: Shalom Sabar, Eliahu Green, José Luis Lacave, \textit{Medieval ketubbot from Sefarad} (Jerusalem: Hebrew University Magnes Press, 2002).

\textsuperscript{112} We have based our study in: Colette Sirat, \textit{Hebrew Manuscripts of the Middle Ages} (Cambridge: Cambridge University Press, 2002). Also in the several works by Malachi Beit-Arié (cf. Bibliography).
outer limits of the written space are marked. Still, there are paper manuscripts without ruling, as is the case of the Ms. Parma 1959. Similarly, these manuscripts are most frequently small books comprising texts intended for study\(^{13}\).

Page layouts and their aesthetics were primarily based in the ruling that establishes the proportion of the text and surrounding margins, but also in the function and contents. Hebrew texts with *targumim\(^{14}\) implied different areas in the page, and their juxtaposition was most likely copied from Latin glossaries. Finally, the use of title pages is virtually inexisten in manuscripts. Their inclusion only became common with the introduction of the printing press.

2.3.2. Catchwords and repeated words

Catchwords are present in the earliest codices. The marking of the middle of the quire with graphic signs was also used to ensure the order of the quires, mostly in Muslim lands. Catchwords are particularly interesting, as while there usually is an effort in copying the text in a standardised way, catchwords often display a personal decoration.

There were two ways of implementing catchwords: by repeating the first word at the foot of the preceding page or by repeating the last word of the quire at the beginning of the following page (in this case, they are considered as repeated words)\(^{15}\).

In paper manuscripts catchwords were used for each sheet of leaf. According to Beit-Arié, the implementation of catchwords on each leaf was introduced in Sefarad and other areas in the thirteenth century, but it only became a common practice with paper manuscripts\(^{16}\).

2.3.3. Signatures\(^{17}\)

Signatures in Hebrew books are quite common. Usually, they are designated by Hebrew letters, and are generally employed along with catchwords. There are three main places for signatures: (i) written in the right corner of the upper margin; (ii) in the corner of the lower margin; or (iii) both at the beginning and at the end of each quire. In Sephardic

\(^{13}\) Sirat, *Hebrew Manuscripts*, 125.

\(^{14}\) *Targum* (pl. *targumim*) is an Aramaic translation of the Hebrew Bible, written or compiled from the period of the Second Temple until the early Middle Ages. There are two *targumim*: the Babylonian (also known as *Onkelos*) and the Palestinian.


\(^{16}\) ibid., 54.

\(^{17}\) Signatures are graphical signs included in the folia indicating the right order of the quire.
manuscripts, signatures are usually placed at the head and at the end of each quire. However, signatures are rare in paper manuscripts.

2.4. Inks and writing instruments

In Europe, the ink used in Jewish manuscripts is similar to their Christian counterparts: gallnut with resin to bind it, and a metallic salt. Most often, ink was self-produced and there are many known ink recipes.

In terms of writing instruments, the quill was predominantly used in Europe, often goose-quill, whereas in Muslim countries books were written with a calamus. More importantly, “[m]anuscripts from Western European Christian territories share the same archetype of Hebrew script, ductus and writing instrument (quill), strongly influenced by the Latin script...”\(^{18}\).

3. Writing Hebrew: main palaeographical features

The fundamental feature of Hebrew manuscripts is, naturally, Hebrew language. Hebrew is a Semitic language with a specific alphabet, or alephbet, composed of 22 letters and five final variations (cf. Transliteration system). In Europe, Hebrew language and writing were only adopted definitively in the seventh or eighth century.

One of the most outstanding features of Hebrew script is its continuity. Hebrew letters are usually written separately, and words are divided by large blank spaces. Hebrew is written from right to left, which means that the text is disposed from right to left. Usually, the right margin is straight and the left margin in not so strictly aligned. There are some mechanisms to keep the left margin aligned: (i) by filling out short lines (dilation of letters, spacing last letters or words, graphic fillers, and anticipating the beginning of the next word); (ii) by preventing the margin from exceed (compression of letters and words, abbreviations, and word division); (iii) and by exceeding letters or words (spaced exceeding letters, writing exceeding letters above the end of the line, writing exceeding words diagonally, and writing exceeding letters vertically\(^{19}\).

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\(^{18}\) Beit-Arié, Hebrew Codicology, 53.

\(^{19}\) Ibid., 87-103.
3.1. Geo-cultural families

The division between these branches generally persisted until the end of the Middle Ages, notwithstanding the major changes in the encompassing geo-political structures and cultural domination120. This, nevertheless, does not exclude the possibility of a writing style being attributed to several geo-cultural families121. Hence, Hebrew medieval scripts can be divided into five main geo-cultural entities: (i) Ashkenazic, (ii) Italian, (iii) Byzantine, (iv) Sephardic, and (v) Oriental.

![Figure 3.2. Geo-cultural entities of Hebrew palaeography](image)

Jewish scribal practices can be divided in two main branches122:

3.1.1. “Islamic branch”

It includes the territories under Muslim rule. It is subsequently divided in (3.1.1.1.) Eastern and (3.1.1.2.) Western families. These scripts share the same archetypes of writing and instruments, and are strongly influenced by Arabic calligraphy.

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121 Sirat, Hebrew Manuscripts in the Middle Ages, 180.
122 In Sirat, Hebrew Manuscripts in the Middle Ages, 10.
3.1.1.1 *Eastern families*

There are several families included in the Eastern group. The most common script is the Oriental script, that presents a threefold variation (square, semi-cursive and current semi-cursive). In this group are also included the Yemenite script, Persian, etc.

3.1.1.2 *Western families (Sephardic)*

Initially, western Islamic Jewish script was produced in the Maghreb (Tunisia, Algeria and Morocco) and in the Iberian Peninsula, except for northern Spain, that was under Christian rule. This type of script is known as Sephardic (or Sefardic). This script family was initially developed in Tunisia and subsequently in Andalusia, and later in Morocco and Algeria.

The *Andalusian variant* dominated the Iberian Peninsula\(^{124}\). Sephardic script was not affected by the political and cultural transformations of the Iberian Peninsula. In fact, it was subsequently adopted by Jewish communities in Christian Iberia. It was also adopted in Provence (and Bas-Languedoc), as this area was strongly associated with the Spanish Jewry.

Despite some important common features such as the strong influence of Arabic scripts (particularly in the development of cursive and current modes of writing), Sephardic script is divided in regional variations such as *Maghrebian*, *Catalan* and *Provençal*.

3.1.2. “Christian branch”

This second branch concerns Western Europe. The most significant differences with Hebrew scripts from the Islamic areas are due to the use of different writing instruments (rigid reed in the former, flexible quill in the later), as well as due to the dominating non-Hebrew scripts in the surrounding cultures. This is precisely what groups together the Christian branch of Hebrew scripts.

This branch is further subdivided in *Northern group* (Ashkenazic) and *Southern group* (Italian and Byzantine).

\(^{124}\) Beit-Arié, *Hebrew Manuscripts of East and West*, 32.
3.2. Diversity of script

Similarly to Latin scripts\textsuperscript{125}, medieval Hebrew has a threefold operational quality that can be executed in three different modes: (3.2.1.) square; (3.2.2.) semi-cursive; and (3.2.3.) cursive. Only in Sephardic territories did a fully current cursive develop. The difference between modes is related to the number of strokes: the less strokes the more cursive the script. Yet, cursiveness is not only due to a lesser amount of strokes, that can be considered as the “root” or “skeleton” of the letter, but also to the speed of writing and ligatures between letters in words\textsuperscript{126}.

The threefold execution of Hebrew is multiplied by types and subtypes, which increases the number of shades of writing to over 20 species, not to mention their chronological transformations. Modes can be employed simultaneously. Its specific use in Hebrew books was observed and defined by talmudic scholars of Spain already in the early twelfth century.

Figure 3.3. Chronological evolution of letter forms of the ‘Eastern’ book-hand into semi-cursive Sephardi script\textsuperscript{127}

\textsuperscript{125} The threefold variations of Latin script are: \textit{textualis, hybrida} and \textit{cursiva} (according to Lieftink) or \textit{formata, media} and \textit{currens} (according to Brown) in Janet Bately (ed.), \textit{A Palaeographer’s View: The Selected Writings of Julian Brown} (London, Harvey Miller, 1993).


The classification of scripts is not fixed. It constantly needs adaptation, which consequently creates a hybrid terminology. For instance, the current aspect of a script can be applied to all modes (e.g. current semi-cursive, which is one of the most frequent modes used in the Ms. Parma 1959). To better illustrate this and to fully evaluate the scripts employed in the Ms. Parma 1959, we now propose a quick summary of the most relevant Sephardic modes:

3.2.1. Square script

Hebrew square script style has been in use since the Second Temple period and it is still currently used. It must have crystallised in the Orient before the tenth century. This is the most common type and the most universal (and the most formal). It is also called “book-hand” as it is employed in biblical, liturgical and talmudic texts, or for singling out glossed texts incorporated into commentaries.

![Figure 3.4. Sephardic square script (fourteenth century)](image)

3.2.2. Semi-cursive, also known as rabbinic or Rashi script or mashait

Semi-cursive mode derives from the cursive writing used for private records, drafts and letters. It was quickly adopted as a book script mainly in owner-produced copies and compilations. In these types of texts it is common to write titles, initial words, sometimes colophons and scribal formulas in square script. The semi-cursive script is often known as rabbinic due to the writings where it is usually used; also, as Rashi, even though Rashi himself did not write with it, and as mashait, an older designation.

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Sephardic mode can be further divided in regular semi-cursive and current semi-cursive (or quick semi-cursive). This is the predominant mode used in the Ms. Parma 1959 (cf. chapter 7 § 3.2.1 and 3.2.2). As an example, the script used in the Commentary to Ecclesiastes (foll. 31v-34r) is more cursive than the one used in the Livro das Cores (foll. 1r-20r), that is written in semi-cursive, and it presents more ligatures and some different letter forms; but the Commentary is less cursive than the recipe for mordant (fol. 28v), which is written in cursive script, as it presents more letter strokes and is less ligatured.

3.2.3. Cursive script

Sephardic cursive script is a fully cursive ligatured hand, clearly influenced by Arabic cursive script, with elongated strokes.

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39 Ibid., 247.
3.3. Other types of Hebrew script

Besides the threefold operational quality of Hebrew script, there are other types of writing such as the writing of the Masorah, *ktav ST*M and other scribal oddities:

3.3.1. Masorah, vocalisation and cantillation

The adoption of the codex coincides with the fixation of the massoretic text. Tenth and eleventh century codices were already accompanied by the masorah, lexical and grammatical annotations indicating the correct spelling, vocalisation and accentuation. These complex annotations were written in minute writing on the upper and lower margins, while shorter and abbreviated notations were written between the columns of the texts and on the inner and outer margins.

With time, the masorah lost its initial meaning and importance, and served as a decorative device, forming sophisticated shapes such as abstract geometrical forms or floral ornaments. All of these forms were based in the minute script that is known as micrography. Naturally, these lines of text are not easy to read, but “[t]he writing here plays a very different role to that which it normally has. The letters are seen without being read, the

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39 ibid., 255.
text is felt to be present even though one cannot or does not want to decipher it. It bears an
eternal message of which the biblical text is the sense and the motif”.

Throughout the Middle Ages, biblical codices present the same *mise en page* as the first
massoretic examples: (i) the consonantal biblical text fills the centre of the page (the work of
the scribe); (ii) the vowels are added by the *naqdan* (the vocalisation of words with a system of
dots and lines); and (iii) and the masorah is written in small letters in the margins (copied by a
massorete). Frequently, the massoretic notes and/or the vocalisation are written by the same
person.

3.3.2. Ktav ST”M

*Ktav ST”M* that stands for Sifrei Torah (Torah scrolls), Tefillin, Mezuzot and Megillot. In
this type of writing are included divorce documents known as *gittin* (sing. *get*). The writing of
these texts is particularly strict and well defined by the *halakha*. If a single letter is wrong the
whole page (or even the whole scroll) is considered *pasul*, that is, non-*kosher* and ruined for
use. The writing of these ritual texts must follow strict rules such as the use of a quill (*culmus*),
ink (known as *d’yr*) and a special parchment known as *klaf*, the outer and hairy layer of the
skin of a kosher animal. This script is equally known as *ktav Ashuri* (Assyrian writing),
although in the Diaspora two primary traditions developed (*ktav Ashkenazi* and *ktav Sephardi*,
also known as *vellish*).

![Figure 3.7. Vellish script (Sephardic)](image)

This script is characterised by the writing of small signs on top of the letters, known as
taggin or ketarim (crowns). Each taga is composed of three small strokes, known as ziyyunin or
daggers. Some letters have three taggin (ט, ט/ט, ט/ט/ט), others just one (א, י, י, י, י).

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333 Sirat, Hebrew Manuscripts in the Middle Ages, 155-157.
334 Maimonides gives a recipe for the ink to be used in these texts: “*One collects the vapor of oils, of tar, of wax, or the
like, and kneads it together with sap from a tree and a drop of honey. It is moistened extensively, crushed until it is formed
into flat cakes, dried, and then stored. When one desires to write with it, one soaks it in gallnut juice or the like and writes
with it. Thus, if one attempts to rub it out, he would be able to. This is the ink with which it is most preferable to write
scrolls, tefillin, and mezuzot. If however one wrote any of the three with gallnut juice or vitriol, which remains without being
rubbed out, it is acceptable.*” in Laws of Tefillin 1:4

335 Copied from: http://www.mezuahman.com/sfard_mez.htm (last retrieved 24/02/2011)
and the rest traditionally have none (ך, נ, צ/ץ, צ, צ/ץ, ק/ק, ר, ש). *Taggin* are considered to be a tradition since Moses and its use is fully detailed in the *Sefer Tagey*, most likely written in the period of the *Geonim*. The best known *Sefer Tagey* is recorded in the writings of Saadia Gaon (in his commentary to *Sefer Yetsirah*). A version of the *Sefer Tagey* is included in the Vitry Makkhor (written in 1208).

3.3.3. Other scribal oddities

Among the many specificities of the writing a Torah scroll, and in addition to the *taggin*, there are several enlarged and reduced letters (for instance, the letter *bet* in *Bereshit*, the first word in the Bible, must be enlarged), and other decorative letters that include spiral forms of the letters *peh* and *tet* and the elongated and often curved extensions of the letters *nun* and *ayin*. Other letters have kabbalistic influences. They are described in the masorah and their use is already attested in the Talmud (*Menahot* 29a).

There is a text entitled *Sefer ha-Taggin* that describes all the specificities of the decorated letters. This text denotes a strong kabbalistic influence\(^\text{16}\) and of a few other known texts, namely the *Makkhor Vitry*. The inclusion of these letters in Torah scrolls is equally advocated by Maimonides (*Mishne Torah, Sefer Ahavah § Laws of Tefillin, Mezuzot and Torah scrolls*).

4. Binding

Similarly to their Christian counterparts, Hebrew books were stored flat and piled on top of another. The binding of Hebrew books could be made by Jews and non-Jews, as the binding of Hebrew books was in all aspects similar to the binding of any other books. Still, there are no examples of Hebrew book bindings prior to the fifteenth century.

Spanish binding, in a traditional *mudéjar* style, was considered for a long time as one of the best. However, recent research has brought to light a high-quality binding that is typical of some Portuguese manuscripts\(^\text{17}\). It is not the usual binding but rather a box-binding unseen in any other Hebrew manuscripts. So far, there have been identified five manuscripts and one

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incunabulum with this particular binding. Four manuscripts and the incunabulum are from Lisbon, whereas the other manuscript is from La Coruña:

(1) Ms. 2 (HUC, Klau Library, Cincinnati). This manuscript is a Pentateuch with haftarot and megillot and it also contains the megilat Antiochus. It was copied by Samuel ibn Musa in 1475;

(2) Ms. 2048 (Ben-Zvi Institute Library, Jerusalem). This manuscript is a siddur (known as the Lisbon siddur), copied between 1484 and 1496;

(3) Micr. 8241 (JTSA, New York), undated, written by a scribe named Isaac and illuminated. It contains Hippocrates’ Medical Aphorisms and Centriloquium that is attributed to Ptolemy;

(4) Ms. 24350 (Schoken Institute Library, Jerusalem), containing the Pentateuch with haftarot and megillot. Undated;

(5) The Kennicott Bible (Ms. Kennicott 1, Bodl. Library), written in La Coruña for Isaac ben Solomon de Braga, by Moses ibn Zabara and illuminated by Joseph ibn Hayyim in 1476;

(6) Pentateuch (Khamisha Khumshei Torah) with the commentary of Rashi and targum Onkelos (Rosenbach Museum and Library, Philadelphia); printed on vellum by Eliezer Toledano in 1491.

Leila Avrin has noted that this particular type of box binding is only found in Jewish books. According to the author, there are enough common elements in these box bindings to establish that they were all prepared in Lisbon in the last quarter of the fifteenth century.

Hence, one important question must be asked: how and to what extent is the binding of the Kennicott Bible associated with Portugal? We have previously suggested a possible connection to Portugal due to the name of the recipient (Isaac, son of D. Solomon de Braga) and due to the suggested association of Joseph and Abraham ibn Hayyim (cf. chapter 2 § 1), even though there are no relevant evidences of any kind of relationship between the two names. We do not know to what extent is this connection the result of speculation.

However, Avrin, who personally examined the boxes, states that the special colophon of the Kennicott Bible must have been added after the book was bound. Also, the pastedowns were decorated by the illuminator, which raises the possibility of the participation of Joseph ibn

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138 Samuel ibn Musa is also the writer of other Portuguese manuscripts and possibly the printer of an incunabulum from Zamora.

139 “Sephardi box binding is unique to Jewish books, and may have been made by the same binder or a single workshop in the late fifteenth century” in Avrin, The Sephardi Box Binding, 30.

Hayyim in the binding of the manuscript and this being done in Portugal. The illuminator could have also been the binder, according to an indication in one of the catchwords 41.

Hence, we believe that it should be considered the possibility of the text of the Kennicott Bible having been copied in La Coruña and the manuscript subsequently bound (and perhaps illuminated) in Portugal.

41 Avrin, The Sephardi Box Binding, 36-27.
ARTISTIC CONTEXT OF THE MS. PARMA 1959

To determine the possible role of the Ms. Parma 1959 within the context of Portuguese Hebrew manuscript illumination, we evaluate in this chapter the main features of Sephardic illumination, with particular emphasis on the Castilian school to which the Portuguese Hebrew manuscripts are suggested to be closely related with. This is followed by the characterisation of the main features of Portuguese manuscripts. We end by raising the possibility of Portuguese non-Jewish manuscripts being a direct (artistic) source of Hebrew manuscripts decorated in Portugal.

1. Decoration of Hebrew books

As we have previously mentioned, the decoration of Hebrew books not only was permitted but it was also encouraged. While scribes were responsible for the precise copy of the text, those entrusted with the decoration rendered in images the non-verbal discursive substance of texts. The mise en page (and mise en texte) was not left to the expression of the artist but rather constrained by material factors such as writing materials and formats, the length of the text and its function, and by economic and social considerations (client’s requirements and social status, aesthetic trends, etc.). Contrary to belief, there was no prohibition towards the representation of living beings. There were, however, severe constrains in the representation of God and some inhibition in the representation of human figures, particularly the human face.

In the Middle Ages the most decorated and illuminated books are Bibles (both in Christian and Jewish contexts). Second, prayer books (siddurim and makhzorim) were also frequently illuminated and, although to a lesser extent, legal codices, philosophical treatises, medical and scientific works were also ornamented. Particularly valued in the medieval period was the hiddur mitzvah (beautification of the commandment) that became the underlying

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142 Beit-Arié, Hebrew Manuscripts of East and West, 84.
justification for the embellishment of books and other ceremonial objects. Occasionally, the previously mentioned works were illustrated, but in general only the *haggadah* served as a “canvas” for the depiction of biblical narratives. In fact, and notwithstanding the *haggadah* being exclusively used in the home environment, the inclusion of narrative painting raises important questions such as the injunction of the second commandment. Yet, “[t]he avoidance of figurative motifs (...) seems to come from Islamic aniconic approach rather than a narrow interpretation of the biblical precept.”

2. Sephardic illumination

Although Hebrew books were continuously copied in all periods, there are no illuminated manuscripts from the Visigothic and Moslem periods. The oldest extant known Sephardic manuscripts with decoration date from the thirteenth century. From this date onwards, and until 1496, Hebrew books were continuously illuminated all across the Iberian Peninsula. Different schools of illumination developed their unique styles, that were in most cases homogenous in terms of decoration and iconographic concepts and in their repertoire of forms.

Most scholars suggest three constituents that are common to all schools: (i) the perpetuation of a Jewish tradition from earlier periods; (ii) the direct stylistic relation to general contemporary schools of art; and (iii) the preference for Islamic styles, that demonstrates an effort to maintaining cultural values of traditional Sephardic Jewry.

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143 “Study should always be in beautiful books, pleasant for their beauty and the splendour of their scripts and parchments, with elegant ornament and covers. And the places of study should be desirable, the study halls beautifully built so that people’s love and desire for study will increase... It is also obligatory and appropriate to enhance the books of God and to direct oneself to their beauty, splendour and loveliness. Just as God wish to adorn the place of His sanctuary with gold, silver and precious stones, so is this appropriate for His holy books, especially for the book that is ‘His sanctuary’. ” Profiat Duran, *apud* Ilana Tahan, *Hebrew Illuminated Manuscripts* (London: The British Library, 2007), 9.
144 The *haggadah* only became a separate book in the thirteenth century, and the oldest known *haggadah* dates from 1300.
Sephardic illumination, especially the decoration of Bibles, is frequently viewed as the perpetuation of previous decorative programmes that were passed down from their Middle Eastern predecessors and introduced in Spain during Islamic rule. This idea invokes the notion of “continuity”, in the sense of repetition of previously existing ornamental schemes as a result of copying. Yet, there are no extant illustrated manuscripts from the Islamic period, and the theory of continuity “remains within the realm of conjecture”.

This notion of “continuity” is mostly associated with the depiction of the Temple utensils, typically in fourteenth-century Catalan manuscripts (but also present in Castilian manuscripts). The representation of the Temple imagery is seen as a continuous tradition since late antiquity and thus demonstrates continuity between Middle Eastern and Sephardic illumination. Yet, and except for the depiction of the Temple utensils, the decoration of Hebrew books is mostly ornamental and denotes a strong Islamic influence. “Continuity” seems to only exist in general terms and it is essentially seen in scribal decoration techniques such as penwork, calligraphy and micrography.

The decoration of Hebrew manuscripts, particularly Bibles, stems from functionality. The decoration of specific parts of the text such as the indication of the beginning of verses or

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149 Kogman-Appel, _Jewish Book Art Between Islam and Christianity_, 8.
150 This is particularly suggested by Bezalel Narkiss in _Hebrew Illuminated Manuscripts_ (New York: Macmillan, 1969); also by Kurt and Ursula Schubert in _Judische Buchkunst_, vol. 1 (Graz, 1994).
151 Katrin Kogman-Appel, _Jewish Book Art Between Islam and Christianity_, 5.
152 ibid., 221.
parashiot (weekly portions) perhaps encouraged ornamentation. In addition, traits such as the writing of the masorah enabled the development of highly complex decorative patterns. The masorah was written in micrographic script and it became an extremely popular feature, eventually developing into a full page (known as carpet-page). The use of micrography and carpet-pages became one of the most typical features of Hebrew manuscripts from the Iberian Peninsula and are frequent in Portuguese manuscripts.

No doubt, and even though the large majority of Hebrew books were produced in Christian environment, in some cases, even in areas with no Muslim presence whatsoever, their artistic language is closely related to the Islamic culture. Illuminated manuscripts “reflect the cultural world of upper-class Jews, who strove to preserve the symbiosis between Judaism and Islam and, for the most part, embraced a rationalistic approach”\(^{53}\). The decision to use an Islamic artistic idiom must also be understood in relation to the cultural and political environment: there was already a familiarity with the Islamic idiom; but also there may have been some reluctance in “coping with models borrowed from a culture that was often hostile and, at the least, competitive”\(^{54}\).

The main connection of typical Sephardic book illumination with their Christian counterparts are the figurative cycles depicting the history of the People of Israel as narrated in Genesis and Exodus. They appear in haggadot, but instead of accompanying the text they are disconnected and independent from the text\(^{55}\). One might ask how many of these representations are copied from Christian manuscripts, but also to what extent are they the work of Christian artists.

The bonds between Jews and non-Jews were often violent and destructive; yet, they were also culturally fertile, stimulating and enriching\(^{56}\). In the field of booklore it is particularly interesting to observe the interaction with other cultures, as there are clear evidences of cooperation between Hebrew and non-Jewish book artisans, and “[t]hese striking testimonies demonstrate more than merely scribal contacts. They reflect scribal association and cooperation which might modify the common image of the cultural ties between Jews and Christians in the Middle Ages”\(^{57}\).

\(^{53}\) ibid., 223.


\(^{55}\) Kogman-Appel, “Hebrew Manuscript Painting in Late Medieval Spain”, 246.


\(^{57}\) ibid., 14.
Clearly, the impact of the local environment can be viewed as acculturation or assimilation. Typically, when considering the history of the Iberian communities, the most common idea is that of ‘convivencia’\textsuperscript{158}, a period when the three main religions coexisted and interacted, and deeply contributed to the transmission of ancient knowledge into Europe. However, this notion is often exaggerated and it must be viewed solely in cultural terms. Moreover, the history of Spain itself is a shifting period between an Islamic environment to a Christian one, and acculturation can be viewed not necessarily as a result of a direct contact, but rather as cultural influence and borrowing.

Hence, two artistic idioms characterise all Sephardic book production. These idioms are distinct, they largely overlap but never blend. They combine two different formal languages, the decorative elements used in Islamic culture with those reflecting Gothic art:

\textit{(1)} The first idiom is non-figurative, non-narrative and almost aniconic, with a clear preference for ornament that is deeply influenced by Islamic art forms. This idiom can be linked to the Judeo-Islamic circles, and must be interpreted as an effort to keeping alive the cultural values of traditional Sephardic Jewry at a crucial historical moment, when those values were being challenged;

\textit{(2)} The second idiom resembles Christian taste. It is mostly used to narrate the story of the People of Israel. It reflects the acculturation to Christianity as well as a significant effort to cope with the Christian contents of these borrowings. However, narrative cycles are in close relation to Ashkenazi scholarship and the revival of Midrashic exegesis arising from an anti-rationalist worldview\textsuperscript{159}.

3. The ‘Castilian school’ and ‘Hispano-Portuguese’ book illumination (fifteenth century)

Decorative programmes of Castilian manuscripts mirror the blending of Jewish and Islamic culture. Thirteenth and fourteenth century manuscripts are the result of a glorious moment in the history of Castilian illumination; nevertheless, fifteenth century books already show a decline that reflects the deterioration of the situation of the Jewish communities.

In general, fifteenth century Bibles contain modest decorations where there is a clear predominance of micrography. There are some examples that denote some degree of influence

\textsuperscript{158} The best known and most extensive work about this subject is: Vivian Mann, Thomas Glick and Jerrilyn Dodds (eds.), Convivencia: Jews, Muslims and Christians in Medieval Spain, exh. cat., Jewish Museum, New York, 1992.

\textsuperscript{159} Katrin Kogman-Appel, Hebrew Manuscript Painting in Late Medieval Spain.
of Italian and French styles, seen in some use of Gothic foliate designs. Yet, these manuscripts cannot be grouped as a single unit.

No doubt, micrographic decoration in Bibles is a continuation of the Islamic tradition, and many manuscripts illuminated in Toledo, Cordoba and Seville reveal this type of decoration. One possibility suggested by Thérèse Metzger is that the dates and locations point to the migration of programmes (together with scribes and illuminators) due to the persecution waves in the second half of the fifteenth century\(^{66}\). This is also her reasoning concerning the production of illuminated books in Portugal, as the author suggests that Portuguese manuscripts are a direct continuation of Castilian manuscripts. However, Katrin Kogman-Appel suggests that Metzger’s claim in relation to the migration of programmes is problematical and she demonstrates the fallacy of Metzger’s argument\(^{65}\).

Hence, in Hebrew manuscripts from Castile, there are very few figurative or narrative illustrations, and there is a clear option for micrographic decoration that is used in the masorah magna\(^{65}\) and in other scribal ornaments such as parashah (portions) signs and seder (order of readings) markings, and in full carpet-pages. Also, there is some use of interlaced vegetal patterns, that are inspired in thirteenth century decoration, as well as some micrographic frames.

Regarding the scope of our research, the Castilian school is particularly significant due to its association with the Portuguese or the so-called “Lisbon school”. The abundant use of micrography in particular has been considered as a clear indication of the continuity of the Castilian decorative programmes in Portugal. Yet, it must be underlined the fact that Castilian manuscripts do not generally use the ornate foliate design that characterises the Portuguese school, and the Italian (and Flemish) influence denoted in the Portuguese manuscripts has no correlation in the Castilian group. This does not, however, mean that Italian, French (and Flemish) styles were unknown in Castile, and there are examples that denote those artistic tastes. Still, the predominant decoration in fifteenth-century Hebrew books from Castile is modest and mostly micrographic.

Still, there are striking exceptions such as the First Kennicott Bible (Ms. Kennicott 1, Bodl. Library), one of the most lavishly illuminated manuscripts. As we have previously mentioned, the Kennicott Bible was copied in La Coruña by Moses ibn Zabarah in 1476 and decorated by


\(^{66}\) Kogman-Appel, Jewish Book Art Between Islam and Christianity, 204-5.

\(^{65}\) Masorah magna is the massoretic text written in the upper and lower margins, whereas the masorah parva is written on the side margins and between the columns. The masorah parva consists of brief notes with reference to marginal readings.
Joseph ibn Hayyim for Isaac, the son of Don Solomon de Braga. The decoration style and decorative programmes are undeniably inspired in the Cervera Bible (BNP, Ms. Hebr. 72)\textsuperscript{65}, a thirteenth century manuscript kept at the Portuguese National Library, and, to a lesser extent, in Catalonian manuscripts.

The Kennicott Bible is an unusual example both for decoration and localisation, as there are no other known manuscripts from Galicia. Following Kogman-Appel and a few other scholars, we thus propose the evaluation of several evidences that have already been pointed but never considered in conjunction, and that may contribute to the association of the Kennicott Bible with Portugal:

(1) The Kennicott Bible is an isolated phenomenon: there is no earlier tradition of illuminated manuscripts from Galicia and there are no other examples after it. The geographical proximity of La Coruña to Portugal and the historical circumstances surrounding the Spanish communities in the period of production of the Kennicott Bible should be reason enough for us to consider the possibility of the text having been copied in La Coruña and the illumination added in a subsequent moment, already in Portugal. In addition, the recipient of the Bible was Isaac son of Don Solomon de Braga, which most likely is related to the Portuguese northern city of Braga, where records show the presence of a small Jewish community in the fifteenth century\textsuperscript{64} (cf. chapter 2 § 1). Also, there are several other examples of manuscripts copied in Spain and subsequently decorated in Portugal, as is the case of the Bible of the Hispanic Society of America (New York, HSA, MS. B. 241);

(2) Even though the illumination of the Kennicott Bible is sumptuous (“replete with painted decoration combining Gothic style and Islamic elements”\textsuperscript{65}), the decoration is described as a “flat linear style (...) with heavy outlines”\textsuperscript{66} that is dominated by arabesques combined with foliage and other vegetal and floral elements\textsuperscript{67}. Also, the masorah mostly comprises geometric (simple) patterns which are not similar to the Cervera Bible\textsuperscript{68}. These are the features that most typically characterise the Portuguese group. Generally, illumination schools in the Iberian Peninsula are homogenous and they favour a specific type of decoration that is generally applied;

\textsuperscript{65} Such influence is seen in the anthropomorphic colophon and in the inclusion of narrative and some figurative illustrations (such as the narrative of Jonah).


\textsuperscript{65} Kogman-Appel, Jewish Book Art Between Islam and Christianity, 212.

\textsuperscript{66} Ibid., 216-7.


\textsuperscript{68} Kogman-Appel, Jewish Book Art Between Islam and Christianity, 213.
(3) The similar box-binding of the *Kennicott Bible* with some Portuguese manuscripts. The box-binding is only found on Jewish books and it may have been made by the same binder or a single workshop in the late fifteenth century⁶⁶⁹. This Sephardic box-binding is found in several manuscripts and incunabula associated with Lisbon such as a Pentateuch and five *megillot* (Ms. 2, Klau Library, HUC, Cincinnati) and in the *Kennicott Bible* (cf. chapter 3 § 4). The box-binding of the *Kennicott Bible* was later modified in Germany but it is still possible to see the main features of the original binding;

(4) Even though (at least for now) we discard the possibility of a direct connection between Joseph ibn Hayyim (the illuminator of the *Kennicott Bible*) and Abraham b. Yehuda ibn Hayyim, some authors suggest it to be a valid hypothesis, since the latter includes the *Livro das Cores* that explicitly deals with the preparation of pigments and paints for book illumination⁶⁷⁰. In addition, the *Livro das Cores* includes several recipes for the colouring of wood and bone, that can perhaps be associated with the preparation of box-binders.

4. Portuguese Hebrew manuscripts

Following the characterisation of the main features of Sephardic illumination and of the Castilian school, it is now left to assess the Portuguese illuminated manuscripts. From the group comprising all the manuscripts associated with Portugal, 26 are decorated. Manuscripts with decoration are exclusively written on parchment, and they are essentially biblical texts, exegetical works and liturgical books. Even though micrography is most commonly associated with Bibles, there are a few exceptions in the Portuguese group, namely Maimonides’ *Mishne Torah* executed in Lisbon in 1472 (London, BL, Ms. Harley 5698):

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Portuguese manuscripts present strikingly homogenous similarities in terms of
decoration, which may point to the use of the same methods and perhaps the same stencils. There is an abundant employment of micrography, that has been interpreted as a local *mudéjar* influence, and the use of decorative frames suggested to be inspired in Italian and Castilian manuscripts. Other features are the use of highly stereotyped frames with a restricted number of patterns, and the utilisation of a refined technique seen, for instance, in the elaborate filigree-work and in the burnished gold letters. Yet, the hallmark of Lisbon manuscripts is the combination of gold script enhanced by a violet filigree background.

The use of micrography is not exclusive of Portuguese manuscripts, and it is part of a long decorative tradition in Hebrew manuscripts in general. Thérèse Metzger states that Portuguese micrographic decoration is the least interesting of the whole Iberian Peninsula, whereas Sed-Rajna suggests that the simplicity of Portuguese manuscripts is a particular feature that follows the general tendencies of local art for a given region. Sed-Rajna also states

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72 Sed-Rajna, *Manuscrits hébreux de Lisbonne*, 103. We should note that the *mudéjar* influence is mostly applied in the context of Spanish book production, and only to a lesser extent to Portugal.
73 ibid.
74 Sed-Rajna, *The Lisbon Bible, 1482.*
that “[a]insi la micrographie n’est pas un ornement en soi mais l’élément variable d’un ensemble dont le texte, l’élément stable, fait partie intégrante”\textsuperscript{77}.

Essentially, micrography is used in carpet pages and in massoretic notes both at the margins of the text and in the middle of the columns. Micrographic drawings fill the entire page, forming intricate patterns similar to carpets. In the Abravanel Bible, (see figure 4.3), that is precisely the predominant type of decoration. The Abravanel Bible, copied and decorated between 1401 and 1450, (Biblioteca da Universidade de Coimbra, Ms. 135) is thought to have belonged to Isaac Abravanel, who was the owner of an impressive medieval library. It is one of the oldest Portuguese Bibles and it lacks some of the most frequent features of other Bibles, but it is richly decorated with micrographic drawings, which is also a predominant characteristic of the Portuguese group. This Bible is yet to be fully studied.

![Figure 4.3. Detail of fol. 3r, Bible of Abravanel](image)

Similarly, the Lisbon Bible (British Library, Or. 2626-28), which is one of the most accomplished manuscripts from the Lisbon group, includes several carpet pages decorated with calligrams (see figure 4.4), although it also combines micrographic decoration with floral frames (see figure 4.5). In addition to the floral motifs, this Bible is decorated with some animal motifs; it is rich in colour and in gold leaf.

The Lisbon Bible was copied by Samuel b. Samuel ibn Musa for Joseph b. Yehuda Al-Hakim in 1482. Ibn Musa copied four other manuscripts and he may also have been their illuminator.

\textsuperscript{77} Sed-Rajna, \textit{Manuscrits hébreux de Lisbonne}, 99.

\textsuperscript{78} https://bdigital.sib.uc.pt/bgz/UCBG-Cofre-1/UCBG-Cofre-1_item1/P7.html (Last retrieved 25/05/11)
Figure 4.4. London, British Mus. Or. 2626, fol. 179v

Figure 4.5. London, British Mus., Or. 2628, fol. 185r
Yet, and similarly to most Hebrew Bibles, the most common type of decoration is the writing of the masorah. Most Bibles present purely geometric motifs usually built from simple figures such as circles, triangles, rhombus, etc.

As previously mentioned, the production of Hebrew manuscripts most often conveys the influence of the local artistic environment combined with traditional Jewish iconographic programmes, thus enabling a great variety of styles. Portuguese manuscripts have been described as the result of the double influence of the local mudéjar heritage and of the predominant taste, deeply marked by the Italian Renaissance and by Flemish tradition 179. The mixture of all of these influences is seen, for instance, in the frequent use of floral and vegetal frames.

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179 Sed-Rajna, Manuscrits hébreux de Lisbonne, 106.
Figure 4.8. London, BMus., Or. 2626, fol. 1r

Figure 4.9. New York, HSA, Ms. B241
Figure 4.10. Duke of Sussex’s Portuguese Pentateuch (Lisbon, 1489-90) BL, Ms Add 15283, fol. 88r

Figure 4.11. Duke of Sussex’s Portuguese Pentateuch (Lisbon, 1489-90) BL, Ms Add 15283, fol. 114v
Manuscripts associated with Portugal are often categorised as “Hispano-Portuguese” due to their strong affinity with other Iberian schools\(^8\). However, the impact of Italian taste in Portuguese manuscripts has been pointed as a distinctive feature in relation to Castilian Hebrew manuscripts that do not denote a particularly strong Italian influence and whose main decoration feature is micrography (cf. § 3). Still, Portuguese Hebrew manuscripts are mostly viewed as a continuation of Castilian manuscripts and seldom are considered in the context of Portuguese (Jewish and non-Jewish) book illumination.

Hence, an important question poses: to what extent can we establish a direct influence of Portuguese (non-Jewish) manuscripts in their Hebrew counterparts? It seems that only Thérèse Metzger seems to deliberate upon this hypothesis\(^8\), even though there were few studies the author could rely on. Metzger also suggests an equally strong Flemish influence, noticeable for instance in the colour schemes. However, she eventually assumes that all of these features are the result of a direct influence from Spanish manuscripts (both Hebrew and Latin or in the vernacular). Hence, the author advocates that Portuguese Hebrew illumination is essentially an extension of Spanish illumination.

In our opinion, this idea of a mere continuation of Spanish illumination in Portuguese Hebrew manuscripts is incorrect, and the idea of the inspiration in non-Jewish Spanish manuscripts for the Portuguese manuscripts seems rather outlandish, when the more obvious hypothesis would be the non-Jewish Portuguese manuscripts, which were widely available to the Jewish elite taking part in the court, and which was the same elite sponsoring Hebrew manuscripts. Granted, there was a significant influx of Spanish Jews into Portugal, yet it seems rather unlikely that they would bring non-Jewish manuscripts with them.

Also, economic bonds with Italy and the Low Countries seems insufficient to justify the iconographic choices of the Portuguese Hebrew manuscripts. No doubt, there is an undeniable connection of the Portuguese school with other Peninsular centres, particularly with the Castilian school. However, the impact of Portuguese Christian illumination techniques and iconographic programmes in their Hebrew counterparts is yet to be examined, and it may be the veritable source of the so-called Italian and Flemish influences.

The last decades witnessed a growing number of studies\(^8\) about Portuguese manuscripts that were not available in the 1970’s and 80’s, when the few studies on

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\(^8\) Metzger, *Les manuscrits hébreux copiés et décorés à Lisbonne*, 194-5.

\(^8\) One of the most abridging volumes on Portuguese Illumination: Aires Augusto Nascimento, Aires Augusto and Maria Adelaide Miranda (eds.). *A iluminura em Portugal, Identidade e Influências* - *Catálogo da Exposição 26 de Abril a 30 de Junho* ’99 (Lisbon: Ministério da Cultura and Biblioteca Nacional, 1999).
Portuguese Hebrew manuscripts were conducted. Hence, and in direct relation to our study, we believe that it should be assessed the possibility of a direct influence of non-Jewish Portuguese manuscripts, which clearly denote an Italian and Flemish influence, on the Portuguese Hebrew manuscripts. One of the best Portuguese examples of such influence is the *Book of Hours of D. Duarte*, most likely decorated in Portugal by Flemish artists. This manuscript, and others similar to it share a decoration associated to phytomorphic motifs: thistle leaves, flowers and multicolour foliage. No doubt, there are some similarities with the typical frames and decoration of the Portuguese Hebrew manuscripts.

![Image](image.png)

**Figure 4.12. London, BMus., Or. 2626**

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The evaluation of the impact of Christian illumination in the Portuguese manuscripts must be done thoroughly and in the present moment we have to comply to the scope of our research. Still, we must consider the following: Sephardic illumination is frequently seen as the reflection of the Peninsular Jewish communities. Fifteenth century illumination is usually taken as a symbol of decline, that eventually culminated in the expulsion in 1492. Yet, in Portugal a prosperous community flourished, with close bonds with the Crown and with the intellectual elite of the country. Similarly to their Spanish counterparts, Hebrew Portuguese manuscripts mirror the situation of Portuguese Jewry. Nevertheless, the reflection is not decline but rather elevation and cultural assimilation.

PART TWO

Analysis of the Ms. Parma 1959
In the second part of our dissertation we proceed to the analysis of the Ms. Parma 1959 to establish any direct connection with Portuguese Hebrew manuscripts. In this chapter we examine each of the 20 philological unit to fully understand the contents of the Ms. Parma 1959. Through our analysis we have concluded that this is not a random compilation but rather a well-organised volume. It is entirely dedicated to the particularities of the preparation, copy and decoration of Hebrew religious texts such as tefillin, mezuzot and megalot, as well as Bibles and liturgical books (codices).

1. General overview

The majority of texts is written in Hebrew. The exceptions are the Livro das Cores and four additional recipes, all written in Portuguese. The first two recipes (fol. 28v) are listed by Richler and Beit-Arié as Spanish but we were able to confirm that they are written in Portuguese instead. Two other recipes (fol. 79r) may also be written in Portuguese. Due to the quality of the ink and the type of writing we were not able to read the first one. The second seems to be in Portuguese and considering several other common aspects between the two recipes we assume the first is written in the same language. We provide the transliteration of the recipes on fol. 28v and the second on fol. 79r in appendix D.

We have based our initial study in previous descriptions and listings of the Ms. Parma 1959, particularly the most recent provided by Luís U. Afonso. We have also taken into account former descriptions such as the one by Benjamin Richler and Malachi Beit-Arié and the initial description by Giovanni De Rossi. Our research updates the previous descriptions with the analysis of a few additional textual units such as a pizmon on fol. 78r. In addition,

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188 Pizmonim (sing: pizmon) are Jewish songs and melodies sung in religious festivities and rituals.
we have opted to divide the recipe on fol. 79r in two separate units, although we consider them as related.

The following analysis is based on the consult of photographs of the manuscript provided by Luís Urbano Afonso. Our conclusions were later verified with the direct consult of the manuscript at the Biblioteca Palatina de Parma.

2. Philological units

2.1. O Livro de Como de Fazem as Cores das Tintas (foll. 1r-20r)

The first text of the Ms. Parma 1959 deals with technical aspects for the preparation of pigments and paints for book illumination. It is written in Portuguese with Hebrew script and it is the only Portuguese medieval technical source for the preparation of pigments and paints. Due to the wrong interpretation of the colophon, it was initially assumed to be a thirteenth century text (1262). However, recent research has convincingly proved it to be from the fifteenth century.

The text is divided in several parts, although all parts generally deal with the same subject, the preparation of colours. We dedicate Part Three of our dissertation to the study of the Livro das Cores.

2.2. Calendar of regular and leap years with lists of Torah readings (foll. 20v-28r)

The second text of the Ms. Parma 1959 lists the 14 types of Hebrew years and their respective religious calendar. Each of the first three letters gives specific information: the first letter indicates in which day the year begins; the second letter provides information regarding the type of month — if it is complete (Heb. shlemah), the letter will be י, that is, the months of Kislev and Cheshvan have 30 days; if it is a common year (Heb. kesidrah), the letter

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will be ל, that is, the month Kislev has 30 days and Cheshevan 29 days; if it is incomplete (Heb. chaserah), the letter will be ט, that is, the months of Kislev and Cheshevan have 29 days; finally, the last letter indicates the day of Pesakh (Easter): Sunday: כ; Monday: י; Tuesday: קל; Wednesday: ט; Thursday: ט; Friday: י; Saturday: כ. The second word refers to the two main types of years: regular (Heb. peshutah) and leap (Heb. meuberet). In this last case, there is an additional month Adar. Hence, the first title indicates the following:

The second palaeographical unit of the Ms. Parma 1959 is divided in the following chapters:

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<tr>
<th>Chapter</th>
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<tr>
<td>1</td>
<td>שבת פסחנה</td>
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<td>2</td>
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<td>שבת פסחנה</td>
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<td>6</td>
<td>שבת מועד</td>
</tr>
<tr>
<td>7</td>
<td>שבת פסחנה</td>
</tr>
</tbody>
</table>

Table 5.1. Chapters in the Calendar for regular and leap years (fol. 20v-28r)

2.3. Recipe for glue from stag’s horn (fol. 28v)

פָּרָאֵר פָאָיִיר בָּאָא יָאִיבּנְגֶרְוַדּוּ דִי קָוֹרַדִי צִירֵבּ. “Para fazer bom engrudo de corno de cervo” (Eng.: “To make good glue from stag’s horn”).

The first recipe on fol. 28v provides instructions for the preparation of glue from a burnt stag’s horn. This recipe is written in a very clear Portuguese and not Spanish, as described in Richler and Beit-Arié’s catalogue. In terms of contents, this recipe may be related to the Livro das Cores, which provides instructions for the preparation of animal glue, more

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92 Richler and Beit-Arié, Hebrew Manuscripts in the Biblioteca Palatina in Parma (cf. appendix C § C.3).
specifically, fish glue from congee-eel on chapter 3, parchment glue on chapter 40 and additional instructions regarding binders for gold.

The language of this recipe is very clear, except for a few words such as “çidaço”, which must be a type of textile, and “taleidas” (which, in the context, may mean “small pieces”). This recipe and the Livro das Cores seem to share the same language and the same transliteration system: ₇ represents /k/ and never ₈, ₋ is both /s/ and /ʃ/, etc. However, the word “cervo” is spelled יسرائيل in this recipe, whereas in the Livro das Cores is a rare case of a double vav: יسرائيل (cf. chapter 10 § 2.3). We provide the full transliteration and translation of the recipe for glue from stag’s horn in appendix D §D.1.

2.4. Recipe for size (fol. 28v)


The language in this second recipe is not as clear as in the first one, but the process describe seems to deal with the preparation of a size or bole for silver letters. This second recipe is also in Portuguese, although there are a few linguistic and transliteration differences (e.g. פירה פירא “pera” instead of פירה פארא “para”). Also, the word “vinagre” (vinegar) is spelled in two different ways: יוגרים (line 4) and ינגר (line 8), which may suggest a less coherent transliteration system. Another important difference is the handwriting that shall be examined (cf. chapter 7 § 4.5). Despite these differences, this recipe seems to be similar to the previous one and to the Livro das Cores. For full transliteration and translation see appendix D § D.2.

2.5. Scriptural passages to be written in tefillin (fol. 29r-30v)

יודבר יהוה, אל-משה לא-אמר. “And the Lord spoke unto Moses...”

The fourth textual unit is composed of scriptural passages to be written in tefillin. Tefillin are two small cubic black boxes with black straps attached that contain biblical scriptures. One box must be placed in the forehead and the other strapped seven times around the arm, hand and fingers. Their use is compulsory each weekday morning (although in the past they may have been worn all day), except during Shabbat and festivals. They are in accordance with the biblical commandment stated in Deuteronomy 6:5-8 (“[…] Bind them as a sign on your hand and let them serve as a frontlet between your eyes.”).

Inside the boxes are tiny parchments with biblical passages, which are to this day hand-written with ink by a scribe. The arm tefillin consists of a single strap of parchment with four
biblical verses placed in four parallel columns, whereas the head tefillin has four compartments with four separate parchments. On fol. 86r there is a sketch of a tefillin box and the textual order (cf. chapter 8 § 4.1).

The biblical verses are in accordance to Rashi’s order: Exodus 13:1-10 (Kadesh Li) and 13:11-16 (Vehayah Ki Hieviecha), Deuteronomy 6: 4-9 (Shema) and 11: 13-21 (Vehayah im Shemoa). There are two sets of tefillin texts:

- fol. 29r: Kadesh li and Vehayah ki Hieviecha
- fol 29v: Shema and Vehaya im Shemoa (ends in the next folio)
- fol 30r: Vehaya im Shemoa (continuation) and Kadesh Li
- fol. 30v: Vehayah ki Hieviecha, Shema and Vehaya im Shemoa

2.6. Notes on the Masorah (fol. 31r)

There is a marginal note: דוד המליאום אס תלך ידיך ליעת דקן שלמה ("in the Masorah"). Fol. 31v comprises a list of textual references related to the masorah. For example: (I Kings 11:4 — “For it came to pass, when Shlomo was old...").

From c. 400 B.C. to c. 200 A.D. a group of scribes known as Soferim standardised the consonantal text of the Bible (massoretic text). They counted verses, words and letters of each book and recorded the results (masorah finalis). If the numbers did not match, the scribe would be able to find the error. After c. 500 A.D. the vocalisation of the biblical text was also included, which until then was based in the oral tradition. There are several systems and the most common and best known is ben Asher’s massoretic text (tenth century).

In addition to the masorah finalis, there is another group of notes, the masorah marginalis, that is divided in masorah parva (in the side margins) and masorah magna (in the top and bottom margins). The masorah parva lists notations regarding the literal form of the text such as defective writing, hapax legomena and other features; the masorah magna records specific lists of many of the items noted on the masorah parva.

2.7. Commentary on Ecclesiastes 9: 14-10:2 (fol. 31v-34r)

"Small city".

The biblical text in Ecclesiastes 9 narrates the story of a city besieged that was save by the wisdom of a poor wise man. This commentary following rabbinical tradition views such

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193 There is another textual order known as the Rabbeinu, where the Shema comes in the end after Vehayah im Shemoa.
narrative as an allegory of the body and its parts. It may be related to Samuel Ibn Tibbon’s commentary on Ecclesiastes. The inclusion of the first verses of Ecclesiastes to convey the idea of how a single fool can destroy all wisdom.

2.8. Midrashic extract (foll. 34r-35r)

ד ה המקרא כך: “This I found in the Mekhilta”.

“Mekhilta” is an Aramaic word that means “measure”, “rule” or “method”. In this case it refers to certain fixed rules of scriptural exegesis used in halakhic midrash. The title “Mekhilta” by itself usually refers to a compilation of halakhic midrash on the book of Exodus, also known as Mekhilta deRabbi Ishmael. It is unlikely that R. Ishmael (90-135) is the real author (or compiler) of the final work, even though many of his interpretations are included in the Mekhilta, and the midrash halakhah falls within his school of interpretation. Yet, the majority of the Mekhilta actually consists of midrash aggadah that expands upon biblical narrative, or deals with ethical or spiritual question.

According to Richler and Beit-Arié this extract is not found in the Mekhilta but rather in chapter nine of the Pesikta de-Rav Kahana and in Genesis Rabbah, Leviticus Rabbah and Tanhuma. The text is incomplete.

2.9. Asher b. Jehiel: Asheri (laws of ST’M) (foll. 37r-77r)

הלכות התורה. “Laws concerning Torah scrolls”.

This text is described in Richler and Beit-Arié’s catalogue as being Asher b. Jehiel’s Asheri. Asher b. Jehiel was an important Talmudist born in Germany who died in Toledo in 1328. Another possibility is that this text (or at least the first part) is Halakhot Katanot, by Isaac Alfasi (1013-1103). The text is divided in the following sections:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Folios</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>הלכות ספר תורה</td>
<td>fol. 37v</td>
</tr>
<tr>
<td>2</td>
<td>מספר העיטין</td>
<td>fol. 39v</td>
</tr>
<tr>
<td>3</td>
<td>הלכות מצוה</td>
<td>fol. 52r</td>
</tr>
<tr>
<td>4</td>
<td>ארבע פרשיות</td>
<td>fol. 65r</td>
</tr>
</tbody>
</table>

Table 5.2. Chapters in Asheri’s text (foll. 37r-77r)

194 Samuel b. Judah Ibn Tibbon (c. 1165- c. 1232), who was part of a distinguished family of Jewish scholars, also translated Maimonides, Aristotle’s Meteorology and Averroes.

Chapter 1 and chapter 3 deal with the rules of Torah scrolls and mezuzot, respectively. Due to the quality of the ink, it is difficult to read the first chapter.

The second chapter may be an excerpt from Judah b. Barzilai’s Sefer ha-‘Itim. Barzilai was a well-known Spanish Talmudist from the eleventh/twelfth century.

Chapter four (“Arba Parashiot”) concerns four special parashiot (reading portions): (i) Parashat Sheqalim; (ii) Parashat Zakhor; (iii) Parashat Para; and (iv) Parashat Hahodesh.

2.10. Poem “Yesod ha-sod ve-sod ha-yasod” (fol. 78r)

יוד והסוד והסוד והסוד

(“Yesod ha-sod ve-sod ha-yasod”). “Foundation of the secret, and secret of the Foundation”.

This is a poem or piyyut that may have been written in Aragon by “Isaac the singer” in 1462. It is listed in the Sassoon Catalogue. It may be a kabbalistic song due to the title. Richler and Beit-Arié do not refer this text and Afonso mentions it as unidentified. It may be related to the pizmonim and baqashot on foll. 197r-209v.

2.11. Recipe for a “beautiful colour” (fol. 79r)

פירו אוי קיווא פרימושא קור

(“Pera o coiro fermosa cor” (Eng.: “For the leather beautiful colour”).

The first recipe included in fol. 79r seems to be written in Portuguese, although we do not exclude the possibility of it being Galician-Portuguese. This recipe is particularly difficult to read due to the cursive nature of the script, the language employed and the bad state of the writing. Yet, and since the second recipe on fol. 79r has been identified as Portuguese, we assume that this recipe is equally written in Portuguese. The theme of the recipe seems to be the colouring of leather. Despite script similarities, we have opted to treat the text on fol. 79r as two separate units that are clearly related.

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2.12. Recipe for mordant(?) (fol. 79r)

“Pera isto medes tomaras cal virgen” (Eng.: “For this measure(?) you shall take quicklime”).

We believe that this recipe should be considered as an independent philological unit, despite palaeographical similarities with the previous one. Whilst we could not identify the language of the previous recipe, this second recipe is written in Portuguese, which leads us to conclude that so is the previous one. This recipe is also difficult to read due to the cursive writing, but it seems to instruct on the preparation of a mordant for leather to be used in books, most likely in the binding of books. This recipe is connected to the previous recipe. We provide a full transliteration and translation in appendix D § D.3.


הלכות תפילה לבן המוריה. “Tefillin laws”.

Selections from Sefer ha-Manhig by Abraham b. Nathan from Lunel, also known as Yarkhi (c. 1155 - 1215), a Provençal rabbi and a talmudic scholar who settled in Toledo in 1204. Here he wrote the Sefer ha-Manhig (lit. “Book of Customs”), also known as Manhig Olam (“Customs of the World”). Abraham b. Nathan recorded the various customs he saw during his travelling in France, Spain and Germany in the Sefer ha-Manhig, which functioned as a guide or a manual showing that there was a halakhic basis for every custom. The book is divided in two parts: the first is a collection of responsa and the second part contains extracts of halakhic works of important rabbis such as Alfasi. This work was one of the first of this kind to be written in Europe.

The text in the Ms. Parma 1959 is divided in several parts that include laws of tefillin, mezuzah, scrolls, divorce, meals, etc., and it ends with the traditional epistolary conclusion: Shalom A.B.N. (“Greetings, Abraham ben Nathan”).

Table 5.3. List of divisions in the Sefer ha-Manhig

<table>
<thead>
<tr>
<th>תפלות תפילה לבן המוריה</th>
<th>fol. 8or</th>
<th>גן</th>
<th>fol. 1159</th>
</tr>
</thead>
<tbody>
<tr>
<td>סמיטין ית זרעי זולות</td>
<td>fol. 92r</td>
<td>גן</td>
<td>fol. 1165</td>
</tr>
<tr>
<td>מחות</td>
<td>fol. 94r</td>
<td>גן</td>
<td>fol. 1179</td>
</tr>
<tr>
<td>הלכות מגלה</td>
<td>fol. 104r</td>
<td>גן</td>
<td>fol. 1195</td>
</tr>
<tr>
<td>הלכות גנ בpee אוים</td>
<td>fol. 109v</td>
<td>גן</td>
<td>fol. 1200</td>
</tr>
<tr>
<td>טמר</td>
<td>fol. 110v</td>
<td>גן</td>
<td>fol. 1230</td>
</tr>
<tr>
<td>גנ</td>
<td>fol. 112v</td>
<td>גן</td>
<td>fol. 1235</td>
</tr>
<tr>
<td>גנ</td>
<td>fol. 113v</td>
<td>גן</td>
<td>fol. 1236</td>
</tr>
</tbody>
</table>
(1). According to Richler and Beit-Arié, “the laws of tefillin correspond to version A in the Jerusalem 1967 edition (pp. 587-599) but with many variations, and this copy probably represents a different redaction” 97;

(2). This part of the text is the *responsa* of the rabbis of Aragon. The beginning of the text seems to deal with invalid Torah scrolls;

(3). Laws concerning *mezuzot*;

(4). Laws concerning *megillot*;

(5). – (12). Laws concerning divorce (bills, *khalitsah*, etc.). According to Richler and Beit-Arié, “the form for the bill of divorce is dated 1294 and not 1304 as in the edition” 98;

(13). Laws concerning feast meals.

2.14. *Extract from Maimonides’ Mishne Torah (Sefer Madda) (foll. 139r-140v)*

פָּרָק שֶׁשֶׁיְּסַפְּר מִדְּבָרָהָ בֶּן מֶשֶׁה בֶּרֶ מֶשֶׁה גֵז"ל

“Chapter sixth from the Book of Knowledge (Sefer Madda) of our rabbi Moshe bar Maimon”. This is a reference to the *Mishne Torah* (“Repetition of the Torah”), that is a code of Jewish religious law and one of the most influential works in Jewish thought. It was compiled between 1170 and 1180 in Egypt, and it consists in 14 books subdivided into sections, chapters and paragraphs.

The first is *Sefer ha-Madda* that is divided in five sections. The first section is the *Hilkhot Yesodei ha-Torah* (“The laws that are the foundations of the Torah). The text is divided in ten chapters and chapter six deals with nine *halakhot* regarding, among several other aspects the sacredness, writing and erasure of the name of God, the materials where it is written and the laws concerning the destruction of holy books 99.

2.15. *Legend about the Septuagint (foll. 141r-142r)*

אֵלָה הָקְדַמָיִם שֶּׁהָיִינוּ מְשָׁתֵכֵים הָדוֹקְסִים בּוֹהֵרָה

“These are the things that were old variations in the Torah”.

98 Ibid.
99 (1) the destruction of the name of God; (2) the seven names of God and the punishment for their erasure; (3) the erasure or not of some of the letters linked to the name of God; (4) erasure of the name of God; (5) descriptive names used to praise God and which ones cannot be erased; (6) the writing of the name of God on metal or glass utensils; (7) several other prohibitions; (8) forbidden to burn or to destroy sacred texts; and (9) sacredness of the name of God in specific passages.
According to Richler and Beit-Arié, this is the “legend about the preparation of the Septuagint, listing the 13 Biblical verses that the Sages unanimously agreed to translate differently from the massoretic text”\textsuperscript{200}. There is a connection with the Babylonian Talmud (\textit{Megillah} 9a), the tractate \textit{Sofreim} and \textit{baraita}:137.

The legend about the Septuagint states that 72 Sages translated the Torah into Greek and, according to the Talmud, there were intentional changes introduced unanimously by the translators into the text, to prevent misunderstandings. According to the \textit{baraita}: 137, King Ptolemy assembled the 72 Sages and placed them in 72 rooms, and did not reveal to them for what purpose he had assembled them. He went to each one individually and asked them to translate the Torah. All the Sages agreed and they all wrote the same.

2.16. \textit{Mishne Torah} (\textit{foll.} 142v-184r)

 הלכות ספר תורה תפили' ומזוות . “Laws concerning Torah scrolls, \textit{tefillin} and \textit{mezuzah}”.

According to Richler and Beit-Arié this unit is a compilation from sections of the \textit{Mishne Torah} that includes \textit{Sefer ha-Madda}\textsuperscript{201}, laws of Torah scrolls, \textit{tefillin} and \textit{mezuzah}\textsuperscript{202} (cf. § 2.14). This text includes a small introduction and it is divided in chapters. Chapter 6 deals with \textit{mezuzot}. Chapter 8 is subdivided into instructions relatively to Torah books (10-14).

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
1 & הלכות ספר תורה תפили' ומזוות \textit{foll.} 142v \textit{f.} \\
2 & פרק ראשון \textit{foll.} 142v \\
3 & פרק שני \textit{foll.} 146v \\
4 & פרק שליש \textit{foll.} 149r \\
5 & פרק רביע \textit{foll.} 153r \\
6 & פרק חמיש \textit{foll.} 158r \\
7 & פרק שיש \textit{foll.} 160v \\
8 & פרק שביעי \textit{foll.} 162r \\
9 & פרק שמיני \textit{foll.} 167v \\
10 & ספר בראשית \textit{foll.} 168v \\
11 & ספר בראשית \textit{foll.} 169v \\
12 & ספר בראשית \textit{foll.} 172r \\
13 & ספר בראשית \textit{foll.} 173r \\
14 & ספר בראשית \textit{foll.} 175v \\
15 & פרק תשיעי \textit{foll.} 177v \\
16 & פרק תשיעי \textit{foll.} 181r \\
\hline
\end{tabular}
\caption{Table 5.4. List of divisions in the \textit{Mishne Torah} included in the Ms. Parma 1959}
\end{table}

2.17. \textit{List of oddly shaped letters found in an accurate Torah scroll} (\textit{foll.} 184v-195r)

מלפפות وكוודות וקואמות ונחותים . “List of the oddly shaped letters found in an accurate Torah scroll by Abraham bar Yehuda ibn Hayyim” (cf. chapter 3 § 2.3.3.).

\textsuperscript{200} Richler and Beit-Arié, \textit{Hebrew Manuscripts in the Biblioteca Palatina in Parma}, 472.

\textsuperscript{201} Perhaps \textit{Sefer Ahava} (?)

\textsuperscript{202} ibid.
There is no doubt about the authorship of this text. According to the prologue the text is written by Abraham bar Yehuda ibn Hayyim:

I will write the swirls and the dots and curves and the crowns(?) I Abraham b. Yehuda ibn Hayyim, I wanted to write the crowned (?) letters in taggin and swirls and curved letters that I have [personally] found in an accurate Torah Scroll ...  
(Free translation)

With time, the use of anomalous letters became less common due to the interpretation that their true sense was no longer understood. Torah scrolls without the shatnez getz are very rare and are exclusively medieval. There are very few known Torah scrolls from the Iberian Peninsula with these letters. Recently, one of these Torah scrolls was found and studied. This particular Torah scroll is linked to the kabbalistic circle of Shem Tov ben Abraham ibn Gaon, from the thirteenth century. It should be noted that the thirteenth century timeframe coincides with the date initially interpreted by de Rossi (1262) according to the colophon found in fol. 195:

“Were completed the letters ... And I finished them, Abraham ibn Hayyim, in the city of Loulé, on the fifth day of the month Sivan [May] in the year two and twenty [twenty-two] from the Creation”.  
(Free translation)

As we have said, the date was initially interpreted by Giovanni de Rossi as being 1262:

“Singularis, ineditus, ignotus est primus ille liber, qui et rationem continet auri praeparandis pro miniaturis, ut praefixus indicat titulus: «Hic incipit liber de modo conficiendorum colorum omnium ad pingendos auroque etiam miniando libros. Constat is capitulis 45, involutaque quadam ac lectu difficili subscriptione explicit, quae nomem exhibet Abrahami fil. Jehudaei aben Chaiim, qui nescio an libri tantum descriptor sit, vel etiam aueto. Quae sequuntur constitutioves anonymae videntur et ipsae desumptae ex celebri rituum compendio Manhigh, ut notatae sub n° 4.° et 6.° De nono opusculo ejusque

203 Shatnez getz are letters shin, ayin, tet, nun, zayin, gimel, tzadi, often referred to by the acronym shatnez getz that require taggin of three strokes.

204 Our knowledge on this Torah scroll is based in the text accompanying the description of a Torah scroll to be sold by Sotheby’s (LOT 142): www.sotherbys.com/app/live/lot/LotDetailPrintable.jsp?lot_id=1... (Last retrieved: 16-12-2009).
Yet, as we could confirm, there is no reference to the sixth millennium in the colophon. De Rossi’s interpretation was later challenged by Leopold Zunz, who suggested that the Ms. Parma 1959 was rather composed in the sixteenth century. Zunz argues that de Rossi ignored the dates of the writing of the texts included in the manuscript examined and the type of calligraphy used. Zunz points three arguments that justify a later dating of the Ms. Parma 1959: (i) the language employed; (ii) the inexistence of a reference to the sixth millennium in the colophon; and (iii) the calligraphy that is similar to other sixteenth century manuscripts. Yet, most studies on the language, the calligraphy and the paper watermarks place the Ms. Parma 1959 in the fifteenth century instead. Zunz further suggests that the possibility of the text of the anomalous letters being a copy of a previous text, which should not be excluded. This is particularly relevant as there are examples of colophons copied verbatim from previous copies.

The text included in the Ms. Parma 1959 is not so much a treatise but rather a practical list of the occurrences on an accurate Torah scroll of the spiral and curved letters as well as the use of taggin (cf. chapter 7 § 4.8). It is divided according to the books of the Torah.

<table>
<thead>
<tr>
<th>Section</th>
<th>Chapter</th>
<th>Fol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ספר בראשית (Genesis)</td>
<td>בראשית</td>
<td>fol. 184x</td>
</tr>
<tr>
<td></td>
<td>התחלה</td>
<td>fol. 185x</td>
</tr>
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<td></td>
<td>אנרכ</td>
<td>fol. 185x</td>
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<td></td>
<td>שרה</td>
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<td></td>
<td>יטוק</td>
<td>fol. 186x</td>
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<td></td>
<td>achte: (?)</td>
<td>fol. 186x</td>
</tr>
<tr>
<td></td>
<td>שלח</td>
<td>fol. 187x</td>
</tr>
<tr>
<td></td>
<td>עוגב</td>
<td>fol. 187x</td>
</tr>
<tr>
<td></td>
<td>(?) ונש</td>
<td>fol. 187x</td>
</tr>
<tr>
<td></td>
<td>(?) ונש</td>
<td>fol. 187x</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Chapter</th>
<th>Fol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ספר במדבר (Numbers)</td>
<td>במדבר</td>
<td>fol. 192x</td>
</tr>
<tr>
<td></td>
<td>ראשה</td>
<td>fol. 192x</td>
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<td></td>
<td>הקיתל</td>
<td>fol. 192x</td>
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<td></td>
<td>קרח</td>
<td>fol. 193x</td>
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<tr>
<td></td>
<td>לבלק</td>
<td>fol. 193x</td>
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<td></td>
<td>פינחס</td>
<td>fol. 193x</td>
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<td></td>
<td>במטה</td>
<td>fol. 193x</td>
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<tr>
<td></td>
<td>הסיעם</td>
<td>fol. 193x</td>
</tr>
</tbody>
</table>

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205 de Rossi, MSS. Codices hebraici biblioth. I. B. De-Rossi Ling. Orient. prof. accurate ab eodem descripti et illustrati.


207 Colette Sirat, Hebrew Manuscripts of the Middle Ages (Cambridge: Cambridge University Press, 2002).

208 Carlo Bernheimer, Paleografía ebraica (Firenze: Leo Olschki, 1924).
These letters are strongly linked to the kabbalistic tradition. In the previously mentioned Torah scroll, and among several oddities, it is possible to find the letter shin with seven elongated taggin instead of three (shorter); the letter kof also has an additional taga; letters peh and tet are sometimes spiral; letters nun and ayin have additional curved taggin.209 These are the letters described in the List of oddly shaped letters (cf. chapter 7 § 4.8).

### 2.18. Rhymes about grammar (fol. 196r)


Small rhymes about grammatical rules and dialect use. It is an unknown text and it may be a personal note. It most likely is an addition.

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209 Sotherby’s, LOT 142 (www.sotherbys.com/app/live/lot/LotDetailPrintable.jsp?lot_id=1... (Last retrieved: 16-12-2009).
2.19. Liturgical poems (baqashot and pizmonim) (foll. 197-209)

בקשות. Baqashah.

Foll. 197 to 209 are divided in two types of liturgical poems: 16 baqashot (sing. baqashah), that is, a collection of supplications, songs and prayers normally sung on Shabbat; and ten pizmonim (sing. pizmon). Jewish songs and melodies sung in religious festivities and rituals. Many pizmonim and baqashot included in Hebrew manuscripts were never published.

<table>
<thead>
<tr>
<th>Table 5.6. List of baqashot</th>
</tr>
</thead>
<tbody>
<tr>
<td>מספר</td>
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<tr>
<td>1</td>
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<td>7</td>
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<td>8</td>
</tr>
</tbody>
</table>

In our research we were able to determine the origin of the following:

1) “Echad yachid umeyuchad”. The first baqashah is known to have been written by Avigdor Kara (d. 1439), a German rabbi, kabbalist and poet. This poem was usually sang in the Shabbat prior to the wedding but this may not be the initial tradition of the poem, as there are no references to the groom or the bride.

2) “Kamti lehalel”. This piyut is traditionally of Portuguese origin, known to be sung at the Portuguese synagogue in Amsterdam.

3) “Yigdal (aleikhem)”. Together with “Adon Olam”, this baqashat is one of the best known baqashot, still nowadays. It lists the 13 primary Jewish beliefs according to Maimonides. It was most likely written by Daniel ben Yehuda ha-Dayan in Italy, in the thirteenth century. Sung on Shabbat.

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(4) “Yekhida babor galut”. This song is listed in the Sassoon Catalogue as part of the North African tradition, in the end of the nineteenth century. It is likely to be prior to this date.

(5) “Ey al hananei”. Unknown baqasha. Marginal note seems to suggest it is part of an afternoon prayer. This poem ends with a prologue, thus separating the baqashot from the pizmonim.

(6) “Camti vetaded shnatei”. Unknown baqasha.


(8) “Kol Barue”. This song was written by Solomon ben Yehuda ibn Gabirol (1021-1048). It is part of the Portuguese and Spanish tradition and it is sang in the morning.

(9) “Adon Olam”. This is a very well known piyut written by Solomon ibn Gabirol (1021-1048), one of the most renowned Sephardic philosophers and poets. It is recited daily.

(12) “Dezidemi” (= Decidme, Señora mia). According to Beit-Arié, this is a tune of a Spanish song.

(13) “Shakhar lehadot”. Possibly a poem by Solomon ibn Gabirol.

(14) “Shema Koli”. The first lines of this baqasha are part of a piyyut by Hai Gaon (eleventh century), a Babylonian gaon. However, after the first lines, the text changes to “אדני לך אוקה”, by Moses Gabbai (d. c. 1443).

(15) “Khasti velo”. Beginning is Psalm 119 (samekh).


<table>
<thead>
<tr>
<th>פזמונים</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>יוהו ילך</td>
</tr>
<tr>
<td>2</td>
<td>וזיר ברכה</td>
</tr>
<tr>
<td>3</td>
<td>זמר בעיון</td>
</tr>
<tr>
<td>4</td>
<td>מזמר</td>
</tr>
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<td>ומפי</td>
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<td>ויהיו</td>
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<td>8</td>
<td>ויהיו</td>
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<tr>
<td>9</td>
<td>ומפי</td>
</tr>
<tr>
<td>10</td>
<td>ומפי</td>
</tr>
</tbody>
</table>

Table 5.7. List of pizmonim

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213 We are aware that there is a similar piyyut in the Yemenite tradition, but we were unable to confer it.

214 The same applies for this baqasha.

215 Richler and Beit-Arié, Hebrew Manuscripts in the Biblioteca Palatina in Parma, 472.
Regarding the *pizmonim*, we were able to identify the following:

(2). “Yakhish brakhah”. This seems to be a quick or urgent prayer.

(3). “Libi ubsari”. This *pizmon* is not written in the proper order and it is part of a well-known *pizmon* entitled “Tsahm nafshi leElohim” written by ibn Ezra. It was most likely written for Simkhah Torah.

(4). and (6). “Min hamatsar”. This is Psalm 118. It is part of the *Hallel*.

(5). “Ana Elohim hosheiah na”. Also Psalm 118. It is a responsive song (from the congregation). Associated with this song and “Min hamatsar” are three other songs, that are not included (“Hodu”, “Odecha” and “Baruch Haba”).

(7). “Yom zeh mekhubad”. This *pizmon* poses some problems: it is usually attributed to Israel ben Moshe Najarah, a rabbi who was born in Damascus around 1555 and died around 1625. Undoubtedly, this raises serious questions of whether this part of the Ms. Parma 1959 is an addition to the rest of the manuscript. Another hypothesis, though unlikely is that Najarah learned this poem in Safed (Tsfat), where he lived for some time. We should note that the Safed community is historically associated with Portugal. This *pizmon* is to be sang on Shabbat.

Besides the previously mentioned poems, there are two other, on fol. 204r entitled “Shevet Yehuda”, which seems not to be the work of Solomon Ibn Verga and on fol. 210r that we were not able to identify.

### 2.20. Extract from Sefer ha-Mikhlo (foll. 210v-211v)

“וְאָמַר בְּהֵם רֵד זִינְי קִימְחִי .

According to Richler and Beit-Arié, the last palaeographical unit of the Ms. Parma 1959 is an extract from the *Sefer haMikhlo* (“Book of Roots”). This text is the most well-known medieval Hebrew grammar. It was written by David Kimkhi (cf. chapter 2 § 5).

---

216 *Hallel* is a set of prayers said on special occasions (such as *Pesakh*, *Shavuot* and *Succot*).

217 For instance, the sixteenth century Abuhav Synagogue was named after Isaac Abuhav (or Aboab) from Portugal. The synagogue houses a Torah scroll written by the hand of Isaac Aboab.

218 Solomon ibn Verga (15th-16th century) was a Spanish historian and physician.
3. Main subjects in the Ms. Parma 1959

The few studies mentioning the Ms. Parma 1959 are contradictory. Gabrielle Sed-Rajna evaluates it as a random compilation, whereas Thérèse Metzger underlines a common theme throughout the texts, that is, the copy of Hebrew texts.

Due to our analysis of the philological units of the Ms. Parma 1959 we must side with Metzger. The Ms. Parma 1959 is a well-organised compilation of 20 philological units regarding the specificities of the copy of Jewish texts (cf. appendix C). The texts included deal with three main themes: (3.1) para-textual elements in the copy of Hebrew sacred texts; (3.2.) liturgical texts; and (3.3.) halakha.

<table>
<thead>
<tr>
<th>Theme</th>
<th>U.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Para-textual aspects</td>
<td>1</td>
<td>Livro das Coreş</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Recipe for stag’s horn glue</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Recipe for size</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Recipe for a “beautiful colour”</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Recipe for mordant</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Tefillin texts</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Masorah notes</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>List of oddly shaped letters</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Grammar rhymes</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Sefer ha-Mikhloî</td>
</tr>
<tr>
<td>Liturgy</td>
<td>2</td>
<td>Calendar</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Poem “Yesod”</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>Liturgical Poems</td>
</tr>
<tr>
<td>Halakha</td>
<td>7</td>
<td>Commentary on Ecclesiastes</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Mekhilta</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Asherî</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Sefer ha-Manhig</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Mishne Torah</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Septuagint legend</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Mishne Torah</td>
</tr>
</tbody>
</table>

Table 5.8. Main themes in the Ms. Parma 1959

3.1. Para-textual aspects of Hebrew sacred texts

In this category are included the texts dealing with technical specificities in the preparation of Hebrew texts (codices, Torah scrolls, tefillin, etc.). This comprises the texts

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concerning illumination materials (*Livro das Cores* and the four additional recipes). It should be noted that these texts are not necessarily “Jewish”. An important difference between the *Livro das Cores* and the recipes is the fact that the first is a well-organised text, carefully copied, most likely from a previously existing source. The recipes, on the other hand, due to their cursive writing and the fact that they may be posterior additions (with the exception of the first recipe), may be the result of personal experimentation rather than the copy of a previously known recipe.

Included in the same category are the *Mesorah notes*. The writing of the mesorah is very specific and it usually is more related with the decorative aspects of the text rather than with the text itself.

The same applies to the *List of oddly shaped letters*. Although they can be considered as a tradition, which would include this text in the third theme, the text in the Ms. Parma 1959 is very practical, dealing not with the “meaning” but with the “form” instead, and their writing in the proper locations. Hence, the anomalous letters to be included in the Torah scrolls can equally be considered as para-textual.

In this group are also included the texts for *tefillin*. We believe that this unit is not really dealing with the *tefillin* texts themselves but rather the script to be employed (hence the small letters and the layout of the text).

Finally, two other philological units must be included in this group: the *Grammar rhymes* (which may be an addition, although the type of writing suggests otherwise); and the last unit: *Sefer ha-Mikhlo*lo. Both texts concern the grammar of Hebrew, which can be considered as a para-textual feature.

### 3.2. Jewish liturgy

Essentially, there are two texts included in the Ms. Parma 1959 dealing with the Jewish year and its respective liturgy. The first is the *Calendar*. The types of years are important to regulate fasts, holy days, public readings of the Torah, etc. We believe that this is precisely why this text is included in the volume.

The second unit is the collection of *pizmonim* and *bagashot*, as well as the additional poem (“Yesod”). Most of these poems are to be sung at the synagogue in specific occasions. It is interesting to notice that some of them are clearly associated with the Portuguese liturgy, thus being another identifying element of the connection of the Ms. Parma 1959 to Portugal and, perhaps, to the *siddurim* copied in Lisbon.
3.3. Halakha

Here are included biblical commentaries such as the *Commentary to Ecclesiastes* and the *Mekhilta*, as well as traditionally halakhic works dealing with the rules and traditions associated with the copy of Torah scrolls, *tefillin*, *mezuzot* and *megillot*. Also included in this main subject are the following texts: *Asheri*; *Sefer ha-Manhig*; *Sefer Madda* (*Mishne Torah*); *Septuagint legend*; and *Mishne Torah*.

Finally, and regarding the possible association with the copy and illumination of Hebrew manuscripts in Lisbon, we can conclude that some of the included texts such as the *Livro das Cores* (foll. 1r-20r) the four recipes written in Portuguese (fol. 28v and 79r) and the *Notes on the Masorah* (31r) may be directly associated with their production.
CODICOLOGICAL ANALYSIS OF THE MS. PARMA 1959

In this chapter we discuss some of the most relevant codicological aspects of the Ms. Parma 1959. In order to do so, we have considered the codicological methodology devised by Malachi Beit-Arié and we have taken into account previous descriptions of the volume. We provide an analysis of the watermarks, and we evaluate some distinctive features of Hebrew manuscripts such as the devices for the alignment of left margins. Regarding the process of compilation, we believe that the first texts included in the Ms. Parma 1959 must have been compiled and the following texts added subsequently within a very short period of time.

1. Identification and previous descriptions

Currently held at the Biblioteca Palatina de Parma, the Ms. Parma 1959, previously known as De Rossi 945, was part of Giovanni Bernardo De Rossi’s collection221, one of the most outstanding collections of Hebrew manuscripts222. De Rossi (1742-1831) was a Professor of Oriental languages at the University of Parma and his impressive collection comprises almost 1500 Hebrew manuscripts. In 1816 De Rossi’s collection was acquired by Maria Louisa, the Duchess of Parma and subsequently donated to the Biblioteca Palatina de Parma.

The Ms. Parma 1959 was initially catalogued as “OPUSC · HEB. VAR · AVCT · COD. MS · CHA”. De Rossi wrote the first description of the manuscript (appendix C § C.4). He determined the date of the manuscript as being 1262 based in a reference to the sixth millennium in the colophon. Such reference is not included in the colophon (cf. chapter 5 § 2.17). We do not exclude the possibility that De Rossi is the writer of the marginal note on fol. 1r, (see figure 7.4) due to the more recent script and the colour and quality of the ink.

In 2001 Benjamin Richler and Malachi Beit-Arié edited a new catalogue of the Hebrew manuscripts held at the Biblioteca Palatina de Parma, and they describe the paper used in the Ms. Parma 1959 as having watermarks between 1423 and 1488. However, they do not state the origin of the paper. The origin of the paper has been recently determined by Inês Villela-Petit


who, based on the watermarks she found, established that the paper used is of Italian origin. We provide the analysis of the most relevant codicological elements in appendix E.

2. Material description

The Ms. Parma 1959 is written on good quality paper. It is composed of 211 folia, measuring 144 x 102 mm. There are some signs of humidity and use, but in general the manuscript is in good condition. There are very few evidences of trimming, that are mostly seen in a few marginal drawings. Most catchwords are inside paper margins and the text is comfortably surrounded by well-arranged margins. The fact that most texts share a similar justification, and catchwords are barely cut leads us to conclude that the manuscript keeps its original size. This may point to the fact that the Ms. Parma 1959 must have been copied as a unit (or partially as a unit), which is further confirmed by its palaeography. We will address this in the next chapter.

2.1. Quire composition

Quire composition on paper manuscripts is frequently less regular than on parchment manuscripts. In Sephardic manuscripts, quires of six sheets are the most common, but a considerable number are composed of eight sheets. There are other compositions of four, five, seven, ten, 12 and 14, but this last one is rare.

Regarding the Ms. Parma 1959, we were unable to determine the composition of the quires due to the restoration done to the manuscript in the 1960’s. The quires are sown very tightly, and some additional sheets were included to fill in some of the gaps in the original paper. Also, some pages are missing, as is the case of the page that must have contained the two missing chapters of the Livro das Cores. One leaf has been cut out (77 bis), while others apparently missing are in fact the result of the manuscript restoration. Furthermore, the

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224 For instance, the first half of fol. 1r shows some signs of previous writings, that must have been erased. The ink underneath the text is darker.
226 The restoration was made in Parma at the Allegri (Laborat. Restauro Libri).
227 Clearly, the counting of this leaf was not taken into account; however, there is a small note written in pencil indicating "77 bis".

88
variety of watermarks and their irregular use does not allow us to conclude how they are included.

2.2. Binding

It is unlikely that the manuscript binding is the original one, and it may be a late eighteenth or nineteenth-century binding, which coincides with De Rossi’s classification of the manuscript and its acquisition for the Biblioteca Palatina. The binding is made of reddish cardboard paper, that was most likely restored in the 1960’s. It does not have any decoration except for the spine (see figure 6.1). The spine is brown and it is decorated with common floral and vegetal drawings within rectangles, all in golden paint. It is possible that the spine is older than the rest of the binding.

![Figure 6.1. Spine of the Ms. Parma 1959](image)

2.3. Paper

There are several qualities of paper, some very thin (especially in the first half of the volume), some more thick and rough, but in general the paper is of good quality. It is possible to see wire frame marks, particularly in the second half of the manuscript.

There are many signs of restoration of the paper: for instance, paper margins have been restored for the most part of the manuscript; also, there are small holes in the upper margins that have been filled with more recent paper.
2.3.1. Paper watermarks

Richler and Beit-Arié identified watermarks belonging to a period between 1423 and 1488, according to the watermarks collected in Briquet’s catalogue. However, they do not state which watermarks were found and that the paper must be of foreign origin, since watermarks only began to be included in Portuguese papers much later. In our consultation of the known watermarks circulating in Portuguese incunabula, we could conclude that none coincide with the watermarks found in the Ms. Parma 1959. This is easily explained by the fact that due to the higher quality of foreign paper, until the sixteenth century foreign paper was predominant in Portugal.

In her study of the recipes of the Livro das Cores, Inês Villela-Petit established that the paper used in the Ms. Parma 1959 is of Italian origin, more specifically from Piedmont. Villela-Petit identified the following watermarks:

1. Crown (fol. 23);
2. Horn (fol. 44);
3. Scissors (foll. 52 and 173), an exclusively Italian watermark, most likely from Genoa;
4. an unidentified cross (fol. 73).

We thus would like to revise the watermarks listed by Villela-Petit and add a few more we identified in our consultation of the Ms. Parma 1959. All watermarks are placed in the upper...
inside corner and are most frequently cut (or divided). We have mostly based our research in the online databases of watermarks\textsuperscript{234}.

\subsection{Crown\textsuperscript{235}}

In addition to fol. 23, we found the same watermark on the first page of the \textit{Livro das Cores} (fol. 1), although partially. It is also present in foll. 23, 26, 29 and 37. This watermark represents a typical crown used between 1423 and 1488 (the dates suggested by Richler and Beit-Arié), and it is inverted. It corresponds to the cross identified by Inès Villela-Petit\textsuperscript{236}.

\begin{figure}[h!]
\centering
\includegraphics[width=0.3\textwidth]{crown}
\caption{Crown (watermark), fol. 37}
\end{figure}

As suggested by Villela-Petit, this watermark is similar to: Briquet 4636 to 4648, especially no. 4645 (Lyon, 1459-69) and 4646 (Azeglio, Piedmont, 1473):

\begin{figure}[h!]
\centering
\includegraphics[width=0.5\textwidth]{similar_watermarks}
\caption{Similar watermarks to the crown found in the Ms. Parma 1959}
\end{figure}

On foll. 2, 25 and 30, the watermark identified seems to be the (inverted) upper part of the previous figure.

\textsuperscript{234} In addition to the consultation of Briquet’s catalogue we consulted the following watermark database: http://www.bernstein.oeaw.ac.at/ (last retrieved: 08/08/2011).

\textsuperscript{235} foll. 1, 23, 26, 29, 37

\textsuperscript{236} Villela-Petit, \textit{Les Recettes pour l’iluminure}, 4.
We do not exclude the possibility that this partial watermark is in fact a different type. It could be the lower part of a glove, which was also a common watermark in the second half of the fifteenth century. Yet, it is most likely associated with the previous one, not only due to their similarity but also since they are consecutive.

2.3.1.2. Possible ring

In the Ms. Parma 1959, there are two partial elements that we believe to form a single watermark, due to their shape. Together they form a partial ring with stones (on the left, what seems to be the stones and on the right the circle of the ring):

There are examples of this watermark in several countries. According to Briquet, the ring is an exclusively Italian watermark and it was used by several paper manufacturers (Milan: Briquet 685-688; Piedmont (1474): Briquet 689-697). However, rings with three stones are usually from Germany and the Low Countries. The following two watermarks are particularly close to the one on the Ms. Parma 1959.

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237 Foll. 41 and 45.

2.3.1.3. Ox head

Villella-Petit describes this watermark as a horn and it is unable to identify it. We, however, found an ox head instead. The ox or bull head is one of the most generic watermarks. Briquet lists 13 varieties of this fifteenth-century watermark (no. 547-559). It is particularly associated with Genoa and it is usually related to another common watermark (scissors). The following watermark is particularly similar to the one we have found on the Ms. Parma 1959.

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239 Briquet, Les Filigranes, no. 689.
241 Fol. 44.
2.3.1.4. Column\textsuperscript{43}

![Figure 6.10. Column (watermark), fol. 73 and 74](image)

The column is also a common watermark. Its time-span varies from the fourteenth to the sixteenth century and it has several possible origins (Italian, Swiss, French, etc.)\textsuperscript{44}. The fact that is a partial watermark does not allow us to fully compare it with other known examples. Inês Villela-Petit identified it as a cross, but one of the two possible watermarks are already from the sixteenth century. The author does not exclude the possibility of being a Spanish paper. We believe that the watermark was not identified properly.

2.3.1.5. Scissors\textsuperscript{45}

Along with the ring, we were able to associate two other marks present in the Ms. Parma 1959 that form the drawing of a pair of scissors. We initially interpreted the upper part as a flower, but we soon concluded that it is the first half of the scissors, while the blades are included in the other half of the folia (e.g. fol. 51: upper part of the scissors; fol. 52: the blades).

![Figure 6.11. Possible pair of scissors (watermark), fol. 51 and 52](image)

\textsuperscript{43} Foll. 73 and 74.

\textsuperscript{44} See: Briquet, \textit{Les filigranes}, nos.4388-4421.

Briquet reproduced several similar watermarks originally from Genoa (3736 to 3655). One in particular is quite similar to the one on the Parma manuscript (no. 3744):

![Image of pair of scissors watermark]

**Figure 6.12. Similar watermark of a pair of scissors (Briquet 3744: 1448-1463)**

With the analysis of the frequency of the watermarks, it is possible to conclude that in the five watermarks included in the Ms. Parma 1959 there is a clear predominance of two: the crown and the scissors.

<table>
<thead>
<tr>
<th>Watermark</th>
<th>folia</th>
</tr>
</thead>
<tbody>
<tr>
<td>crown</td>
<td>1, 2, 23, 25, 26, 29, 30, 37</td>
</tr>
<tr>
<td>ring</td>
<td>41, 45</td>
</tr>
<tr>
<td>ox head</td>
<td>44</td>
</tr>
<tr>
<td>column</td>
<td>73, 74</td>
</tr>
</tbody>
</table>

**Table 6.1. Watermarks in the Ms. Parma 1959**

The first 37 folia, where the crown predominates, must have been written in the same paper, that corresponds to the first eight philological units and the first folio of Asher b. Jehiel's *Asheri*. Asher b. Jehiel's text is codicologically interesting: first, the scissors watermarks (foll. 51 and 52) coincide with most of the textual divisions (cf. chapter 5 § 2.9), although we do not exclude the possibility that due its common nature and widespread use, this watermark may not be the same as in the paper used from fol. 84 onwards. Second, besides the scissors and the crown, the three additional watermarks (ring, ox head and column) are included in this

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unit, which leaves the rest of the manuscript written in paper with the same watermark. The rest of the volume is written on paper with the same watermark (scissors).

Hence, with our analysis of the watermarks we are able to conclude that two watermarks predominate (crown and scissors). Due to the possible dates of the watermarks (crown: 1423-1488; ring: 1457-1462; ox head: 1462; scissors: c. 1448-1463), we suggest as a possible date of the copy of the Ms. Parma 1959 somewhere between 1423 and 1463. It should be noted that the date on the colophon on the List of oddly shaped letters may correspond to the year 1462. Still, there is always a reasonable doubt of the true correspondence of some of the watermarks with those in the catalogues.

Finally, and regarding the origin of the paper, the predominant type is Italian, although it could partially be from other locations.

2.4. Format

The Ms. Parma 1959 is quite small, measuring 144 x 102 mm. It is composed of 211 folia. Some folia are missing, as determined by the textual analysis of the Livro das Cores (cf. chapter 12 § 2). Also, at least one page has been cut, and it is numbered as “77 bis”: still, the numbering of the manuscript does not take this into account. Pages are numbered (Arabic numbering) by two hands in the recto side in the upper left: written in black ink, the first twenty folia are all numbered, which corresponds to the Livro das Cores; after this, folia are only numbered every ten pages); also, in the lower right: written in pencil, all folia are numbered. In addition, three texts present a lateral numbering, written in blue pencil: (1) the Livro das Cores (fol. 11); (2) the calendar of regular and leap years (fol. 20v); and (3) Asher b. Jehiel’s Laws of Sifrei Torah (fol. 37r).

The number of lines in the Ms. Parma 1959 can be considered as regular. In the first half, most texts are written in 17 lines except for the Calendar (18) and the Tefillin texts (15-24). The writing of other texts, that can be considered as additions, is different not only in terms of lines, but also of margins and script (cf. chapter 6). Regarding the second half of the manuscript (from the Sefer ha-Manhig onwards), there is a constant number of 16 lines, with the exception of the Rhymes (another textual addition).

2.5. Page layout

There is no apparent sign of ruling (nor pricking), but if following the traditional practice, the Ms. Parma 1959 would have been ruled with a hard point, leaf by leaf. All texts are
well-written with similar number of lines and coherent spaces between them. They are written in a single column and are justified to the right (similarly to all Hebrew texts). Left margins are not always justified; there are, however, some examples of devices employed in producing even left margins such as the dilatation of letters (fol. 2r, etc.), and the compression of letters (fol. 150r), and the common use of abbreviations at the end of lines (fol. 154r). Sometimes, the text is vertically written around the main text (fol. 168v). We should, however, underline that the left margin is not dramatically strictly aligned in the large majority of the texts, even though there is some care in the writing of the text.

In terms of page margins, the upper margin is usually around 20 mm; the lower margin varies according to the writing of the text; left and right margins are usually inversely proportional (following the traditional Golden Rule). Some texts end in the form of a triangle (Sefer ha-Manhig and Mishne Torah).

Most titles are written in enlarged letters. They are sometimes written in square script but most frequently in semi-cursive script. Traditionally, titles were written in square script, but the use of semi-cursive is in accordance with other Portuguese manuscripts (e.g. M-FA-14 from the Biblioteca do Porto), and it is not unusual in the context of Hebrew manuscripts.

2.6. Catchwords

Following common Sephardic practice and taking into account that the Ms. Parma 1959 is a paper manuscript, catchwords are written at the lower right of most folia, on the verso side. They are never ornamented. Very few catchwords are trimmed, essentially in Jehiel’s text. They largely match, except for fol. 12v (Livro das Cores): two chapters are missing; also, the catchword on fol. 50v does not seem to correspond to the first words in the next page; finally, the catchword on fol. 128v corresponds to the first word on the third line of fol. 129r.

2.7. Special marks

There are very few special marks in the Ms. Parma. Still, three marks deserve some consideration. The first is an ornament repeated several times in the Livro das Cores (see figure

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247 The recipes included in the Ms. Parma 1959, due to their nature and cursive writing, are not always justified to the right or to the left.

248 Beit-Arié, Hebrew Codicology, pp. 87-103.

249 There are no signatures in the Ms. Parma 1959, which is common in paper manuscripts.

250 ibid., 58.
This mark is important to establish a possible division in the text and it also appears in the end of the first recipe on fol. 28v.

A second mark is an abbreviation found in fol. 28r and again in fol. 79r. This is a generic Hebrew abbreviation (B”H), that stands for “Barukh haShem” ("Blessed be God"). It is a traditional way to begin letters and other forms of correspondence. We cannot be certain that there is a connection between the two abbreviations due its generic nature.

Finally, a third mark is written in the upper margin of fol. 31v. This abbreviation (which may lack a final heh) must stand for: באברהם אבינו שלום (Peace be upon Abraham our father).

2.8. Ink

The predominant ink used is currently brown, which means that the Ms. Parma 1959 must have been written with a gallnut ink. There is another ink (violet) that is used in some decorative elements, more specifically, on foll. 80r and 142v. As we have previously mentioned, the use of violet ink combined with gold is one of the hallmarks of the Portuguese Hebrew illuminated manuscripts. All the other decorative elements use the same ink of the text. Also, the marginal note on fol. 1r is written with a darker ink, which leads us to conclude that it was not written together with the text and it is a posterior addition.

The first half of fol. 1r shows some signs of previous writing and erasures. It is still possible to see a darker (black) ink underneath the prologue of the Livro das Cores.

There are several ink transitions: the most noticeable one is the difference between the two recipes on fol. 28v; also, the Notes on the Masorah (fol. 31r) shows palaeographical differences that also correspond to ink transitions; there are several ink transitions in the Asheri text, but they do not seem to correspond to hand transitions.
3. Codicological units

Considering all the previous elements, we can conclude that the paper used in the Ms. Parma 1959 is not exclusively Italian. According to the suggested watermarks, it is equally possible to conclude that the copy of the Ms. Parma 1959 was done within 1448 and 1469. Moreover, one of the suggested watermarks date is specifically from 1462 (ox head), which is the same date stated in the colophon on the *List of oddly shaped letters*. This leads us to conclude that the most likely date for the copy of the Ms. Parma 1959 is 1462.

The Ms. Parma 1959 can be divided in three main parts, following the paper watermarks. *Part One* comprises the first eight philological units and the paper used is most likely from Lyon (Briquet, no. 4645).

*Part Two* mostly corresponds to Asher b. Jehiel’s *Asheri* and the following additional texts (recipes and poem). This second part includes a greater variety of watermarks, but it is also thematically related to the previous and the following parts (the recipes deal with similar subjects found in the *Livro das Cores* and the poem is similar to those on the *Litururgical Poems*). Several papers were used in *Asheri*: the beginning is written in the same paper as the first part of the Ms. Parma 1959; foll. 41 and 45 may have been written in paper from Utrecht (Piccard, no. 32341); fol. 44 on paper from Genoa (Briquet, no. 55201); foll. 73 and 74 are written on unidentified paper and foll. 51 and 52 also on Genovese paper (Briquet no. 374432), similar to the third part of the Ms. Parma 1959.

Regarding *Part Three*, it comprises the last eight philological units and it is exclusively written in paper with a similar watermark (scissors) that most likely corresponds to the Genovese paper on foll. 51 and 52. Hence, we propose the following compilation process for the Ms. Parma 1959:

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251 Briquet, *Papiers Filigranes des Archives de Gênes*.

252 Ibid.
<table>
<thead>
<tr>
<th>Process</th>
<th>Unit</th>
<th>Title</th>
<th>Folia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part One</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Livro das Cores</td>
<td></td>
<td>1r-20r</td>
</tr>
<tr>
<td>2</td>
<td>Calendar</td>
<td></td>
<td>20v-28r</td>
</tr>
<tr>
<td>add.</td>
<td>3</td>
<td>Recipe for stag’s horn glue</td>
<td>28v</td>
</tr>
<tr>
<td>4</td>
<td>Recipe for size</td>
<td></td>
<td>28v</td>
</tr>
<tr>
<td>5</td>
<td>Tefillin texts</td>
<td></td>
<td>29r-30v</td>
</tr>
<tr>
<td>6</td>
<td>Notes on the Masorah</td>
<td></td>
<td>31r</td>
</tr>
<tr>
<td>7</td>
<td>Commentary on Ecclesiastes</td>
<td></td>
<td>31r-34v</td>
</tr>
<tr>
<td>8</td>
<td>Midrashic extract</td>
<td></td>
<td>34v-35r</td>
</tr>
<tr>
<td><strong>Part Two</strong></td>
<td>add.</td>
<td>Asher b. Jehiel’s Asher</td>
<td>37r-77v</td>
</tr>
<tr>
<td>9</td>
<td>Poem</td>
<td></td>
<td>78r</td>
</tr>
<tr>
<td>add.</td>
<td>10</td>
<td>Recipe for a “beautiful colour”</td>
<td>79r</td>
</tr>
<tr>
<td>11</td>
<td>Recipe for mordant (?)</td>
<td></td>
<td>79r</td>
</tr>
<tr>
<td><strong>Part Three</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Sefer ha-Manhig</td>
<td></td>
<td>80r-138v</td>
</tr>
<tr>
<td>14</td>
<td>Mishne Torah (Extract)</td>
<td></td>
<td>139r-140v</td>
</tr>
<tr>
<td>15</td>
<td>Seputagint legend</td>
<td></td>
<td>141r-142r</td>
</tr>
<tr>
<td>16</td>
<td>Mishne Torah (Sefer Madda)</td>
<td></td>
<td>142v-184r</td>
</tr>
<tr>
<td>17</td>
<td>List of oddly shaped letters</td>
<td></td>
<td>184v-195v</td>
</tr>
<tr>
<td>add.</td>
<td>18</td>
<td>Rhymes about grammar rules</td>
<td>196r</td>
</tr>
<tr>
<td>19</td>
<td>Liturgical poems</td>
<td></td>
<td>197r-209r</td>
</tr>
<tr>
<td>20</td>
<td>Sefer ha-Mikhol</td>
<td></td>
<td>210v-211v</td>
</tr>
</tbody>
</table>

Table 6.2. Possible process of formation of the Ms. Parma 1959

We have reason to believe that the same person may have compiled and copied the texts included in the Ms. Parma 1959. We shall address the palaeographical questions in the next chapter of our dissertation.
This chapter is dedicated to the analysis of the most relevant palaeographical features of the Ms. Parma 1959. The Ms. Parma 1959 is an excellent example of the manifold operation of Hebrew (Sephardic) script due to its writing in four different modes: semi-cursive, current semi-cursive, cursive and square. We conclude that despite the apparent differences, the volume was mostly copied by the same hand except for a few additional texts (recipes, etc.).

1. Methodology of palaeographical identification²⁵³

According to Malachi Beit-Arié, the palaeographical analysis of any given Hebrew manuscript must comprise the following stages:

(1) isolation of palaeographical units, that is, the determination of whether the codex is a palaeographically homogeneous unit or a compilation of different copies or fragments produced independently. This is done by identifying the types of script and technical or scribal practices, and by examining the writing material and the construction of the quires. This is only achieved with a careful examination, since similar patterns of mise en page and mise en texte frequently affect the perception of similarity. Such similarity ‘derives essentially from a ‘global vision’, or distanced viewing, by which common styles are clearly perceived despite dissimilarities in shapes and other measurable aspects revealed in close scrutiny’²⁵⁴.

(2) the isolation of different hands, that is done with the examination of each unit in order to determine the number of hands that intervened in the copy of the unit. Transitions between hands are evaluated and the specificities of each hand characterised. The identification of different hands can be a difficult task due to the stereotyped nature and deliberate conformism of medieval Hebrew handwriting²⁵⁵. Usually, it is the para-scriptural elements (specific


tetragrammaton forms, graphic signs, catchwords, etc.) that denounce the more individual traits;

(3) the definition of the type of script, perhaps the easiest aspect to establish. Yet, Sephardic script in particular is a complex type, due to its vast geographical distribution and local variants, as well as other specificities (cf. chapter 3 § 2.1.1.2);

(4) its localisation, which can be easily assessed if there is a colophon (even though the names are commonly transliterated in Hebrew and it can be difficult to determine the original word). It should be noted that the type of script does not necessarily identify the region where the manuscript was produced. Due to exceptional historical circumstances of the Jewish people, the type of script employed does not automatically reflect its actual location. This stage must necessarily be accompanied by a codicological (and philological) study;

(5) dating, undoubtedly, the most difficult stage in parchment manuscripts without colophon and not so much the case in paper manuscripts. The inclusion of watermarks is usually sufficient to establish the partial or total date of a given manuscript, although this must be dealt with caution. Yet, the more watermarks the easiest it is to establish the localisation and the date.

2. General overview of the palaeography of the Ms. Parma 1959

The few studies on the calligraphy of the Ms. Parma 1959 are contradictory: Thérèse Metzger suggests that the manuscript is an intentional and homogenous compilation despite the “variety of calligraphies”256, whereas Beit-Arié points to a single copyist of the entire volume, perhaps Abraham ibn Hayyim257. This matter has recently been addressed by Luís Afonso, who identified eight hands (see figure 7.1), with a clear predominance of hands A and E (that is responsible for the copy of 70 percent of the whole codex)258.


257 Richler and Beit-Arié, Hebrew Manuscripts in the Biblioteca Palatina in Parma.

258 Luís U. Afonso, “New developments in the study of O Livro de como se fazem as cores das tintas”. 

102
Following the general methodology devised by Beit-Arié, we began by determining whether the Ms. Parma 1959 is a palaeographically homogenous unit or a compilation. The Ms. Parma 1959 is written in Sephardic script and it is an excellent example of the manifold operation of Hebrew script. The volume is predominantly written in semi-cursive script (regular and current); there are textual additions written in cursive script (recipes, etc.) and a single text is written in square script. There is some use of taggin and the List of oddly shaped letters includes the so-called “anomalous letters”. Catchwords are written in current semi-cursive or cursive script usually similar to the rest of the text.

One of the most striking features of the Ms. Parma 1959 is a common mise-en-page with a similar number and height of lines and margins in the majority of the units. The only exceptions are possible textual additions such as the recipes and poems and the texts for tefillin.

Figure 7.1. Distribution of the different handwritings of Ms. Parma 1959 according to Afonso

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259 Ibid.
Regarding the isolation of hands, we analysed each textual unit included in the Ms. Parma 1959 (cf. appendix F § F.2). In our analysis we used Gamera, an open-source framework for the recognition and classification of the characters in the documents. This software provides specific algorithms for the analysis of documents and it is designed to be used as a tool for creating domain-specific (i.e. customised) recognition applications. It is possible to ascertain that except for the Notes on the Masorah (cf. § 5.5) each unit is written by a single hand.

In addition to the modes of script, we have also considered other features that may be relevant to determine the homogeneity of the volume: (i) average height of sentences, which is quite regular (30 mm in the large majority of the texts); (ii) mode of script, that we will further address; (iii) devices used to keep the left margin aligned (most frequently dilation of final letters, although margins are not strictly aligned); (iv) the writing of the name of God, that is written in

http://gamera.informatik.hsnr.de/
a similar form in all texts (if used); and (v) additional features such as the writing of the letter aleph.

In relation to the localisation, the Ms. Parma 1959 is undoubtedly associated with Portugal. Several arguments contribute to our reasoning: (i) the inclusion of a colophon on fol. 194v where it is stated that (at least) the List of oddly shaped letters was copied in Loulé (south of Portugal); (ii) the fact that there are several texts written in Portuguese; (iii) the watermarks in the paper place the copy of the texts in the second half of the fifteenth century, that is, before the forced conversion or expulsion of the Jewish community from the country, and the moment of the most intensive cultural and artistic Jewish production in Portugal; (iv) the inclusion of some sketches in the Ms. Parma 1959 similar to the typical Portuguese binding; (v) the writing of the manuscript itself, that shares some similarities with other Portuguese paper manuscripts copied in the same period.

Regarding the dating of the Ms Parma 1959, we have already established through the paper watermarks that it most likely was copied in 1462. However, it was initially thought by Giovanni de Rossi to be a thirteenth century compilation due to the wrong interpretation of the date in the colophon and the information in the marginal note on fol. 1r. Yet, the fact that it is written in paper with fifteenth-century watermarks, together with the nature and the dating of some of the texts included such the pizmonim, as well as the practices described in the Livro das Cores, the actual date of copy of the manuscript is the second half of the fifteenth century. Leopold Zunz suggests a later date in relation to the calligraphy of the Ms. Parma 1959. Still, we do not believe that there is a relevant basis to evaluate Zunz’s suggestion, as fifteenth-century manuscripts and early sixteenth-century manuscripts share various features.

3. Variety of script in the Ms. Parma 1959

So far, we have established that the units included in the Ms. Parma 1959 were copied in Portugal simultaneously (or within a short time). It is now left to determine whether the manuscript was copied by a single or several hands. To answer this question the variety of script must be considered:

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### 3.1. Semi-cursive

<table>
<thead>
<tr>
<th>Semi-cursive script</th>
<th>U.</th>
<th>Title</th>
<th>Foll.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td><em>Livro das Cores</em></td>
<td>11-20r</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Calendar</td>
<td>20v-28r</td>
</tr>
<tr>
<td></td>
<td>6(1)</td>
<td>Notes on the Masorah</td>
<td>31r</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Poem</td>
<td>78r</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>List of oddly shaped letters</td>
<td>184v-195r</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Grammar rhymes</td>
<td>196r</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Liturgical poems</td>
<td>197r-209r</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>Sefer ha-Mikhlo</td>
<td>210v-211v</td>
</tr>
</tbody>
</table>

Table 7.1. Palaeographical units written in semi-cursive script

Semi-cursive script in the Ms. Parma 1959 is characterised by its consistent writing with well-designed letters and regular spaces between letters (that are mostly separated). The *Livro das Cores* is the most “formal”, whereas the last two units are almost current. They are described as semi-cursive because they are less ligatured and the letters are written with more strokes than the texts written in current semi-cursive.

In the analysis of the scripts employed in the Ms. Parma 1959, it is possible to conclude that there is a direct relationship between the chosen mode of script and the type of text. In the case of semi-cursive script, it is employed in technical texts (*Livro das Cores, List of oddly shaped letters, Calendar, Notes on the Masorah*) and in philological texts (*Poem, Liturgical Poems, Sefer ha-Mikhlo and Grammar rhymes*).  

### 3.2. Current semi-cursive

<table>
<thead>
<tr>
<th>Current semi-cursive script</th>
<th>U.</th>
<th>Title</th>
<th>Foll.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6(2)</td>
<td>Notes on the Masorah</td>
<td>31r</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Commentary on Ecclesiastes</td>
<td>31v-34r</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Midrashic extract</td>
<td>34v-35r</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td><em>Asheri</em></td>
<td>37v-77v</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Sefer ha-Manhig</td>
<td>80r-138v</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Sefer Mada</td>
<td>139r-140v</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Septuagint legend</td>
<td>141r-142r</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td><em>Mishne Torah</em></td>
<td>142v-184r</td>
</tr>
</tbody>
</table>

Table 7.2. Palaeographical units written in current semi-cursive script
Current semi-cursive script is differentiated from the previous mode due to the more ligatured and cursive writing. We have opted to consider it as semi-cursive rather than cursive because the writing is less ligatured and more defined in comparison to the typical Sephardic cursive writing. Yet, this group comprises some variety, as some of the texts are more cursive than others (particularly Asher b. Jehiel’s text Asheri). We include them together in comparison with the cursive writing of the following group.

The majority of texts written in current semi-cursive writing are *halakhic* texts.

### 3.3. Cursive

<table>
<thead>
<tr>
<th>U.</th>
<th>Title</th>
<th>Fol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Recipe for stag’s horn glue</td>
<td>28v</td>
</tr>
<tr>
<td>4</td>
<td>Recipe for size</td>
<td>28v</td>
</tr>
<tr>
<td>6(3)</td>
<td>Notes on the Masorah</td>
<td>31r</td>
</tr>
<tr>
<td>11</td>
<td>Recipes for a “beautiful colour” and size</td>
<td>79r</td>
</tr>
</tbody>
</table>

Table 7.3. Palaeographical units written in cursive script

Cursive script in the Ms. Parma 1959 is mostly characterised by a higher frequency of ligatures and the lesser amount of strokes used in the writing of letters. In terms of relationship with the type of texts, we consider that cursive writing is only used in the four additional recipes included in the volume and in the second half of the *Masorah notes*. It is used in what can be considered as additions to the main texts.

### 3.4. Square

<table>
<thead>
<tr>
<th>U.</th>
<th>Title</th>
<th>Fol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Tefillin texts</td>
<td>29r-30v</td>
</tr>
</tbody>
</table>

Table 7.4. Palaeographical units written in square script

Finally, the only text written in square script is the *Tefillin texts*. However, the script employed is not the “traditional” (or monumental) square script used in Torah scrolls but rather a small script with *taggin*, with clear similarities with the actual writing of *tefillin*. The
fact that there is a single text written in this script does not allow us to compare it with the rest of the Ms. Parma 1959.

As for “volume” of script, we can conclude that out of the 211 folia of the Ms. Parma 1959, more than half is written in “current semi-cursive script”. Texts written in cursive script can be considered as posterior additions, whereas texts written in a “semi-cursive script” are essentially used in the more technical side of the copy and decoration of Hebrew sacred texts.

<table>
<thead>
<tr>
<th>unit</th>
<th>semi-cursive</th>
<th>cur. s-cur.</th>
<th>cursive</th>
<th>square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>0.5</td>
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</tr>
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</tr>
<tr>
<td>6</td>
<td>0.25</td>
<td>0.25</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
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<td>8</td>
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<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
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</tr>
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<td>18</td>
<td>12</td>
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<td>19</td>
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<td>T</td>
<td>55.25</td>
<td>151.25</td>
<td>2.5</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 7.5. Script division in the Ms. Parma 1959

4. Additional palaeographic features

4.1. Threefold operationally of the letter aleph

A constant feature throughout the Ms. Parma 1959, the alternation between three representations of the letter aleph does not necessarily coincide with the predominant script. We classify it according to the number of strokes (the more cursive with the less strokes):
Regarding its use, it is possible to establish the following:

(1) In semi-cursive texts, there is an almost exclusive use of the semi-cursive *aleph*, except for the *Livro das Cores* and the *Liturgical Poems*, where the three types are employed (although semi-cursive *aleph* is dominant);

(2) In current semi-cursive and cursive texts, there is an alternation between the current semi-cursive and the cursive variants. Such alternation follows a pattern: cursive *aleph* is used at the beginning and middle of words; current semi-cursive *aleph* almost exclusively used at the end.

### 4.2. Representation of the name of God

In all texts (when written), the name of God is exclusively represented by two regular *iods* and a third ornamented:

![Figure 7.4. Name of God in the Ms. Parma 1959](image)

### 4.3. Similar left margin devices

The most common device to align the left margin in the texts of the Ms. Parma 1959 is the dilatation of final letters, sometimes accompanied by the spacing of last words. Another common feature is the writing of exceeding text diagonally or vertically. These devices are not necessarily present in all texts, and they are not always used. In general, margins are aligned but not strictly.
4.4. Marginal note on fol. 1r

There is an additional Hebrew marginal note on fol. 1r that is not written by the same hand of the main text, as the writing seems to be more contemporary and the ink is darker, still black to be more specific.

![Figure 7.5. Marginal note in the Livro das Cores, fol. 1r](image)

<table>
<thead>
<tr>
<th>Marginal note on fol. 1r</th>
</tr>
</thead>
</table>
| זה הספר הוא ילקוטים מעניינים רבים. נכתב ע"י הספרר הרב אברום פנק
| margin note is written by Rabbi Abraham in the city of Loulé in the fifth day of the month Sivan (May) in the year twenty-two of the sixth millennium (year 5022). |

4.5. Elongated letters

A common feature to several texts in the Ms. Parma 1959 is the slight ornamentation of the elongated letters when in the lowest line of the page. Some are more decorated than others:

![Figure 7.6. Examples of elongated letters on foll. 32v (Ecclesiastes), 95v (Sefer ha-Manhig) and 43r (Asheni)](image)
5. Palaeographical comparison

5.1. Livro das Cores and Calendar\textsuperscript{62}

The script in the Calendar, in comparison with the Livro das Cores, is more ligatured and more rounded and stylised. The typical final shin of the Livro das Cores has no match in the Calendar. Other letters such as bet and kof are also different. Letter bet in the Livro das Cores is larger, and kof in the Calendar is more stylised and slightly more inclined:

<table>
<thead>
<tr>
<th>Livro das Cores</th>
<th>Calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td>ב</td>
<td>ג</td>
</tr>
<tr>
<td>ה</td>
<td>י</td>
</tr>
</tbody>
</table>

Table 7.7. Palaeographical comparison between the Livro das Cores and the Calendar

Still, there are no striking evidences that the texts are not written by the same hand and the mentioned dissimilarities can be the result of different times of writing. There are, however, many common traits between the hand of the Calendar and the last palaeographical units, a possibility that again suggests the writing of the entire volume by the same person.

5.2. Livro das Cores and Recipe for glue from stag’s horn

The two units share similarities of language and transliteration system, as well as a specific final mark. They also share some minor palaeographical similarities (despite their writing mode differences) such as ligatures between the letter aleph or bet with vav, iod and heh; other distinctive letters are an ornamented heh and a final shin.

<table>
<thead>
<tr>
<th>The letter shin in the Livro das Cores and Recipe for Stag’s Glue</th>
</tr>
</thead>
<tbody>
<tr>
<td>regular shin</td>
</tr>
</tbody>
</table>

Table 7.8. The letter shin in the Livro das Cores and the Recipe for stag’s glue

\textsuperscript{62} Due to the transliteration system used in the Livro das Cores, not all Hebrew letters are represented. Our comparison is based in the common letters between the two texts.
Besides linguistic similarities, the Livro das Cores and the recipe for stag’s glue use a similar (and regular) transliteration system that excludes letters such as khet of khaf soft, as they do not represent Portuguese phonemes. In the case of two letters representing the same sound such as tet and tav one, there is a clear option for one of them (in this case, the sound [t] is represented by tet and never by tav).

There are some similarities between the two texts of script: the presence of the same variety of shin and the same calligraphic heh; other similarities are less direct: for instance, the script of the recipe mostly resembles the cursive writing of catchwords in the Livro das Cores.

![Figure 7.7. Similar ligature on catchword (fol. 7v) and on recipe for stag’s glue (fol. 28v)](image)

Finally, another important resemblance between the two texts is the inclusion of a similar sign, that seems to give the indication of the ending of the text:

![Figure 7.8. Similar sign at the end of recipe (fol. 28v) and in the Livro das Cores (fol. 18r)](image)

5.3. Livro das Cores and List of oddly shaped letters

In common, the two units are written in a clear semi-cursive script. Yet, it is reasonable to question if both texts are written by the same hand. Notwithstanding the evident contrast due to the writing of taggin and anomalous letters in the List, several other differences point to our conclusion: (i) the more angular writing of the Livro das Cores, whereas the letters in the List are more round; (ii) the letters in the Livro das Cores are smaller than those in the List; (iii) the aleph/lamed ligature is slightly different; (iv) there is more space between the letters in the Livro das Cores.

Despite the differences (that are not substantial) between the two texts, the List of oddly shaped letters shares many similarities with the three subsequent texts and with the Calendar.
5.4. Two recipes on fol. 28v

The second recipe is written in a more current script and letters are enlarged. A significant difference is the final shin in the second recipe. There are some linguistic differences that we have already discussed (cf. chapter 5 § 2.3 and 2.4).

5.5. Notes on the Masorah

This unit is an exception in terms of number of hands: while other units have clearly been copied by a single hand, the Notes on the Masorah seems to be the result of several hands, most likely the work of three hands (cf. appendix F.2 § 6.1–6.3). The first lines are written in semi-cursive script and from there onwards, the text is progressively more cursive. However, and in the case of the same person having written the three parts of the text, it can be an indication that the Ms. Parma 1959 was written by the same person using different script modes (a possibility already raised in Richler and Beit-Arié’s description).

5.6. List of oddly shaped letters

In this text are included the following “anomalous letters”:

<table>
<thead>
<tr>
<th>Anomalous letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>
There are also some additional *taggin* in letters that traditionally do not have them, as well as letters with a different number of *taggin* (cf. chapter 2 § 2.3.3).

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**Table 7.9. Anomalous letters included in the List of oddly shaped letters**

<table>
<thead>
<tr>
<th>Anomalous letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>ג</td>
</tr>
<tr>
<td>י</td>
</tr>
<tr>
<td>innamon</td>
</tr>
</tbody>
</table>

**Table 7.10. Letters with *taggin* included in the List of oddly shaped letters**

<table>
<thead>
<tr>
<th>Taggin</th>
</tr>
</thead>
<tbody>
<tr>
<td>ב</td>
</tr>
<tr>
<td>ג</td>
</tr>
<tr>
<td>ד</td>
</tr>
<tr>
<td>ה</td>
</tr>
<tr>
<td>ז</td>
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<tr>
<td>ח</td>
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<tr>
<td>ט</td>
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<tr>
<td>י</td>
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<td>צ</td>
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<td>ש</td>
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<td>ר</td>
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<td>ל</td>
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<tr>
<td>ר</td>
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<tr>
<td>ק</td>
</tr>
<tr>
<td>ש</td>
</tr>
</tbody>
</table>
Traditionally, letters such as *khaf, mem, samekh, peh* and *resh* have no *taggin*. They are recorded here as having two or three additional *taggin*. Other letters with traditionally a single *tagga* such as *bet, dalet, heh, khet* and *kof* also have additional *taggin*. Finally, some letters have five additional *taggin* (*shin* and *tsadi*).

**6. Determination of the number of hands in the Ms. Parma 1959**

So far, we have evaluated the most relevant palaeographical features in the Ms. Parma 1959. There is no doubt that this is a homogenous volume, despite the different modes of writing. Except for the *Mesorah notes*, each palaeographical unit was written by a single hand, and we believe to have successfully proven that the choice of script is mostly due to the type of text.

Still, the mentioned palaeographical differences between the *Livro das Cores* and other texts raises the question of whether it was written by someone other than the person who wrote the majority of the Ms. Parma 1959. In our opinion, the differences, though noticeable through a careful analysis, are not striking enough to assume that the *Livro das Cores* was written by a different scribe. In addition, the inclusion of a signature at the end of the text could be viewed as an indication of an initial moment of writing of the *Livro das Cores* to which were subsequently added new texts in a posterior (though not distant) moment. Thus, the previously mentioned differences must be ascribed to different moments of writing and not to the writing of different hands.

In conclusion, we strongly consider the possibility of the Ms. Parma 1959 having been copied by one hand that covers the large majority of texts in the volume, except for some of the recipes and the poem on fol. 78r. Also, we do not exclude the possibility of more than one writer of the *Notes on the Masorah*. Regarding the *tefillin* texts, we cannot evaluate whether it is written by the same or a different hand due to the generic aspect of the script and the natural differences with the other texts.
The examination of any given manuscript implies a philological study intertwined with the study of other material aspects involving a codicological and palaeographic analysis, as well as an iconographic study. In this chapter we focus on the few iconographic elements included in the Ms. Parma 1959. Their assessment will contribute to further understand any connection (direct and indirect) with illuminated Hebrew-Portuguese manuscripts and to the evaluation of the authorship of the Livro das Cores.

1. The hypothetical signature of Abraham ibn Hayyim

![Image](image.png)

Figure 8.1. Decorative elements at the end of the Livro das Cores (fol. 20r)

In the last page of the text of the Livro das Cores there are several decorative elements: two fleur-de-lis flank the hypothetical signature of Abraham ibn Hayyim, an ornamented rectangle, and an interlaced square underneath. The fleur-de-lis is a common heraldry symbol initially associated to France, but of general use in medieval times. The decorated rectangle

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and the interlaced square are also common decorative elements, although they point to a mudéjar influence.

Regarding the signature included in the last folio of the Livro das Cores, it has been considered as being Abraham ibn Hayyim’s signature⁶⁴. It is possible to read in the ornamented signature the name אברם בר יהודה (“Abraham bar Yehuda”) in larger letters and, under it, אני חכם (“ibn Hayyim”), although the last word is dubious.

Two other letters OS (S’T) are written before ibn Hayyim. This is an acronym with several possible meanings: (i) “Sephardi tahor” (“pure Sephardi”), a common designation meaning “someone with Sephardic ancestry”; (ii) “sofo tov” (“good end” or “may all end well”), frequently interpreted as a reference to the persecution of Jews in the Iberian Peninsula; (iii) “siman tov” (“good sign”); or (iv) “sin tin”, an Aramaic expression meaning “dust and ashes”, a form of modesty in the signature.

Figure 8.2. Abraham ibn Hayyim’s hypothetical signature (fol. 20r)

Another argument supporting the interpretation of this being ibn Hayyim’s signature is a marginal note on fol. 1r, where it is stated that the text was written by Abraham ibn Hayyim. We have already discussed this (chapter 7 § 4.1), and besides it being a posterior note, we believe that this is not a sufficient proof of the authenticity of the signature. In fact, it is not broadly accepted that this is ibn Hayyim’s signature⁶⁵. Among the arguments is the different handwriting of the signature and the main text. This perception is essentially due to the cursive writing (and ornamentation) of the signature, whereas the main text is written in a regular semi-cursive script. Yet, as we have already argued, the same hand can produce various scripts.


Another justification, pointed out by Thérèse Metzger, is the ink of the signature, that she describes as violet, whereas the rest of the text is written in a brownish ink\(^{66}\). However, in our analysis we could establish that the ink used both in the signature and in the main text is the same ink, that is currently brownish. Violet ink is exclusively used in the Ms. Parma 1959 in the decorative elements on foll. 80r and 142v. Hence, and considering the use of the same ink of the rest of the text, the signature should not be regarded as independent from the text of the Livro das Cores.

The signature itself is not particularly original. It resonates with the common Sephardic signature style, later predominant among North-African authors, particularly in Morocco\(^ {67}\).

Figure 8.3. Signature of Shemtov Ibn Gaon, Salonica, 1403 (Paris, BNF, MS hébr: 790, fol. 170r)

Figure 8.4. Signatures of Moroccan rabbis (M. Klagsbald Collection)

Another signature in a similar style is Joseph Sarfati’s, a Portuguese Jew and the copyist of the Perush haTorah (MS hébr, 222, BNF)\(^ {68}\):

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\(^{66}\) Metzger, Les manuscrits hébreux copiés et décorés à Lisbonne dans les dernières décennies du XVe siècle.

\(^{67}\) ibid.

2. Layout drawings

There are a few geometrical layouts sketched in the Ms. Parma 1959 (foll. 36v and 79v). The sketch on fol. 36v may well be the layout of a page or the layout of the cover. Our initial thought was to compare it with layouts of known Portuguese manuscripts: Gabrielle Sed-Rajna provides the schematic layouts of the illuminated pages with text of the Lisbon group. However, we did not find any layout that matches the sketches on the Ms. Parma 1959.

![Layout drawing, Ms. Parma 1959, fol. 36v](image)

Another hypothesis is the relationship of these geometrical layouts with the box binding of several Hebrew manuscripts associated with Portugal, more specifically, with the so-called “Lisbon school”, in the last quarter of the fifteenth century. A group of more than five manuscripts with this type of binding has already been evaluated by Leila Avrin²⁶⁹ (cf. chapter

Avrin explains that box-binding is only found in Jewish books and are typically from Portugal. Figures 8.7 and 8.8 are the box binding of one of these manuscripts, the *Ibn Musa Bible*, copied by Samuel ibn Musa in Lisbon, in 1475. The morocco used was originally red-brown but it faded into dark brown (not seen in the images we had access to).

We believe that the sketch on fol. 36v shows the same divisions as the lower cover of the *Ibn Musa Bible*. In addition to the *Ibn Musa Bible*, there are other similar boxes using the same materials, layouts and box design such as a *siddur* partially copied by Elieser Gagosh (MS hébr. 592, BNF), figure 8.9. Although these are common geometrical patterns, we have already discussed the importance of this box binding, which has been crucial for the identification of manuscripts copied and illuminated in Portugal. There are at least six books with this type of binding. One of them is the box-binding of the *Kennicott Bible*, figure 8.10.
Leila Avrin has convincingly argued that this type of binding is exclusive to Jewish books and they were made by the same binder or in the same workshop. Hence, and taking into

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270 Metzger, *Les manuscrits hébreux copiés et décorés à Lisbonne*...


account the type of texts included in the Ms. Parma 1959 we have reason to believe that the layout in the Ms. Parma 1959 could be related to the distinctive Portuguese box binding.

3. Decorative frames

Among the few decorative elements of the Ms. Parma 1959 are some ornamental frames in the beginning of two texts (foll. 8or and 142v). These frames are in the same style of Hebrew manuscripts illuminated in Portugal. They are the sole decorative elements drawn with a violet ink. All the other decorations are in the same ink of the texts.

Figure 8.11. Ms. Parma 1959, fol. 8or
4. Unusual drawing (head)

On fol. 142v there is an unusual drawing of a head wearing a hat, at the end of a decorative frame. There are very few other iconographic representations of Jews in Portugal to compare this image with. The few that are known generally serve an anti-Semitic purpose, and their portrait usually follows the stereotype of a man with a protuberant nose and a conic hat.

With regard to the head gown, Jewish men are represented with the typical hat, known as *pileus cornutus*, a general medieval European iconographic depiction. This is the

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representation seen in some illuminated manuscripts from Santa Cruz de Coimbra and in the Chancellery of D. Afonso V. There are few representations of Jews wearing other types of hat. Two exceptions must be noted: the depiction of a Jewish man wearing a regular hat and holding a Hebrew book at the S. Vincent Panels; and another depiction on a painting belonging to the Colegiada de Santa Maria de Guimarães, where a Jewish man is portrayed in dark clothes and wearing a small round hat\(^{274}\).

We thus suggest this to be the representation of a Jewish man wearing the traditional religious hat, the *kippah* (that was usually wore under a larger hat). Hence, and even though we cannot prove such claim, this may well be a caricatural self-portrait of the copyist of the text or the owner of the Ms. Parma 1959. In fact, this is not original: one of the most well-known *haggadot* is the *Birds’ Head Haggadah* (Germany, c. 1300), where Jewish people are depicted with *pileus cornutus* and birds’ heads (with exaggerated beaks).

The use of anthropomorphic figures in Hebrew manuscripts is not unusual, although it is unseen in other Portuguese manuscripts. As we have previously discussed, their iconography is mostly ornamental (cf. chapter 4 § 4). Even though this was not the predominant choice, there are several examples of the use of human figures in Sephardic manuscripts. One of the best examples is the colophon of the *Cervera Bible* (1299) that was subsequently copied in the *Kennicott Bible* (1476). In both cases the name of the illuminator is zoo- and anthropomorphically written with figures somewhat similar to the head on fol. 142v.

5. Other iconographic elements

5.1. Tefillin box

The drawing presented on fol. 86r is the schematic drawing of a tefillin box with the respective prayers’ indications. It is included in the *Sefer ha-Manhig* in the first part (*Halakhot tefilin le baal ha-manhig*).

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5.2. Marginal drawings

5.2.1. Attention marks

A common element to several texts of the Ms. Parma 1959 is the drawing of a hand pinpointing specific parts of the text. They are used in Asher b. Jehiel’s Asheri (foll. 37r-77v), Sefer ha-Manhig (foll. 80r-138v) and in the Mishne Torah (foll. 142v-184r). There is a great variety of sleeves (perhaps indicators of the current fashion), although we do not ignore the possibility that some (or all) having been added in a posterior moment.

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5.2.2. Other marginal drawings

Other drawings in the Ms. Parma 1959 include book divisions of the Torah in the *List of oddly shaped letters* (foll. 184v-195v), written and decorated in a style common to other Portuguese Hebrew manuscripts. Also in the same style are the floral drawings and ornaments filling fol. 196v. As we have previously discussed, the Lisbon manuscripts are usually characterised by heavy frames dominated by floral motifs and calligraphic ornaments. Finally, the inclusion of some Latin initials representing the letter S.

![Initial S](image)

*Figure 8.17. Drawing of the initial S (Ms. Parma 1959, fol. 196r)*

![Another Initial S](image)

*Figure 8.18. Another initial S (Ms. Parma 1959, fol. 196v)*

In conclusion, the few iconographic elements included in the Ms. Parma 1959 allow us to consider the surrounding environment. The signature at the end of the *Livro das Cores* is in
accordance with traditional Sephardic signatures; yet, other elements such as the initials and the attention marks point to a more general environment. In addition, the included sketches and text frames suggest some affinity with other Portuguese Hebrew manuscripts.
PART THREE

The Livro das Cores
Beginning with the most recent and broad research on the Livro das Cores, in this chapter we evaluate its place within the context of technical texts for colour and pigment preparation. We propose a brief description of the main features of such technical texts. We assess what were the most relevant contemporary texts of the Livro das Cores particularly in the Iberian Peninsula, in order to proceed to the comparison of recipes and to establish any possible direct sources underlying the Livro das Cores.

1. “As Matérias da Imagem”

“As Matérias da Imagem: os pigmentos na tratadística portuguesa entre a Idade Média e 1850”, in English “The materials of the image: pigments on Portuguese treatises from the Middle Ages to 1850”, with the reference POCI/EAT/58065/2004 of the Portuguese Fundação para a Ciência e Tecnologia, was a multidisciplinary research project conducted by Vítor Serrão from the University of Lisbon, who led a team composed of art historians, chemists and linguists from several universities. This project began in 2004 and culminated in a colloquium in 2009. The results are published in a collaborative volume edited by Luís Urbano Afonso²⁷⁶.

The research project addressed original Portuguese texts concerning technical aspects of pigment and colour preparation and it was thus focused on two different texts, the Livro das Cores, which was originally thought to be a thirteenth century text, and the Breve Tratado de Iluminação, an anonymous text from the seventeenth century. The diversity of expertise of the team allowed the approach of the several aspects of the texts, such as the analysis of the contents and its reproduction in the laboratory, the historical and the linguistic context, as well as possible historical sources for the two main texts.

One of the most remarkable conclusions was the updating of the date of the Livro das Cores. This was only possible due to a previous study of language undertaken by Devon Strolovich²⁷⁷, and to the systematic study developed by António João Cruz and Luís Urbano

Afonso on materials and techniques employed and vocabulary used throughout the text. The
revision of the date was equally supported by the study of Mark Clarke, who concluded that the
practices suggested in the *Livro das Cores* were particularly used in the fourteenth and fifteenth
centuries. He further determined the context of the *Livro das Cores* within the corpus of
European medieval texts, more specifically, those from the Iberian Peninsula.

A subsequent study on the text of the *Livro das Cores* demonstrated that the text is
divided in three distinct parts, which raises the question of the existence of more than a
single underlying source. The *Mappae Clavicula* was the first to be considered, followed by
several other medieval texts.

Also, linguistic specificities of the *Livro das Cores* were further evaluated in two different
studies: the first focused on the transliteration system and its characteristics, and it was
conducted by Devon Strolovich, a second study, conducted by Prof. Ivo de Castro, focused on
the language and its historical aspects.

As we have previously mentioned, in addition to the studies on the *Livro das Cores* the
project “The Materials of the Image” equally focused on the *Breve Tratado de Iluminação*, which
is published and edited for the first time. The two Portuguese original textual sources were
the pretext to evaluate the pigments in Portuguese painting documents from the sixteenth and
seventeenth centuries, as well as to reflect upon specific technical vocabulary. Some
pigments such as white lead and red lead were considered, as well as blue pigments of
the *Book of Birds* and its impact on the Portuguese *scriptoria*.

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279 More specifically, the reference to brazilwood and mastic gold, which are practices typical of the fourteenth and fifteenth centuries, respectively: Mark Clarke, “The context of the Livro de como se fazem as cores: late mediaeval artists’ recipe books (14th—15th centuries),” in *The Materials of the Image, As Matérias da Imagem*, ed. Luís U. Afonso (Lisboa: Campo da Comunicação, 2010).

280 Luís U. Afonso, “New Developments in the study of *O livro de como se fazem as cores das tintas*”, ibid.

281 António João Cruz, “Em busca da origem das cores de *O Livro de Como se Fazem As Cores*: sobre as fontes de um receituário português medieval de materiais e técnicas de pintura”, ibid.

282 Devon Strolovich, “Old Portuguese in Hebrew Script: beyond O livro de como se fazem as cores”, ibid.

283 Ivo de Castro, “Notas sobre a língua do Livro de como se fazem as cores (Ms. Parma 1599)”, ibid.


285 Vítor Serrão, “Acordar as cores...: os pigmentos nos contratos de pintura portuguesa dos séculos XVI e XVII”, ibid.

286 Vanessa Antunes and I. D. Santos, “Preparação e imprimitura: a matéria invisível”, ibid.


2. Background of medieval technical texts

As far as we know, the oldest records of technical expertise are the two Assyrian glaze recipes written in cuneiform, in the seventh century BCE. According to Mark Clarke²⁹⁰, it is possible to ascertain that Assyrian technology was inherited by Egyptians and then passed on to Greeks. All sorts of texts were preserved in Greek between the third and fifth centuries, and it is precisely from Greek workshops that come the two oldest examples, the Leyden X and the Stockholm papyrus, two fragments from the third century, most likely written by the same scribe.

The mechanics of creation and transmission of these technical texts was usually complex. Medieval texts on colour and pigment preparation are generally the result of compilations over long periods and frequently incorporate various influences²⁹¹. This is the case of the Lucca Manuscript, also known as Compositiones ad tigenda musiva or Compositiones Variae, most likely compiled in the seventh century in Alexandria, following older Greek texts. The oldest extant copy was possibly translated into Latin in Italy around 750-800. The Lucca Manuscript makes references to Assyrian, Egyptian, Greco-Byzantine, Arab and Indian materials, and shares much of its content with other texts, in particular with Eraclius and with the Mappae Clavicula. One of the most known texts in the Middle Ages, the Mappae Clavicula, must have been originally compiled in the fourth century, although the oldest known example is from the ninth century.

Recipes in this type of texts cover a variety of subjects such as metalwork and glasswork, dyeing, mosaic, painting and book illumination. The majority of these texts on painting and illumination of books are from the tenth century onwards. A third of these texts on colour preparation are included in long Latin treatises such as the Schedula Diversarum Artium, which cover several subjects, and they frequently include copies of previous texts. Evidently, there are also newly composed texts, usually shorter and independent treatises, focusing on book illumination techniques and other types of painting (for instance, Cennino Cennini’s Il Libro dell’Arte).

It is possible to establish a difference between manuscripts prior and after 1300 in terms of contents and textual composition²⁹². One of the most important changes is the reduction of the number of copies from earlier texts (for instance, the number of long treatises in Latin

²⁹¹ ibid.
decrease), and the increase of original treatises and collections. Usually, these new and original texts stem from contemporary workshop practice, whereas before 1300 texts do not so much reflect the current state of technology. They continue traditional practices and demonstrate limited technical innovation over long periods  

After 1300, the increase in the number of original texts is also correspondent to the choice of writing in the vernacular, which by the fifteenth century already reached half of the total number of texts. Latin continued to be employed mostly in the (critical or uncritical) copies of older texts and extracts. Original texts often introduced new subjects and relevant practices, eliminating the redundancy of older practices, which may indicate that “they were composed from original observation — that is, they more accurately reflect practices of the time in which they were written”  

Nevertheless, frequently what is considered as an original text is in fact the rewriting of older texts in such a way that it is difficult to determine the source. 

Another common group of texts in the late medieval period are compilations. This type of texts often suggests personal interest and use, even though they do not necessarily imply personal experience, and they frequently are collections of extracts from older texts. Compilations such as household compilations denote the particular interests of either the compiler or the recipient of the text. Indeed, the value of such texts should not be underestimated, as they served as excellent working tools, allowing the selection of subjects and interpolations of recipes. Clarke gives an interesting example of a manuscript for practising professional scribes and illuminators with some useful indications for the students (MS HU 1051, Henry E. Huntington Library, California).

This text, as so many other personal texts is written in the vernacular, which is a common indicator that the text is a personal observation of contemporary practice. These texts “appealed to apprentices and lowly folk, but also to ‘middle class’ merchants, and indeed gentry, while nobles and courtiers often commissioned vernacular translations”  

The idea of the MS Parma 1959 as an “apprentice book” is in a sense pertinent if we consider some of its codicological features such as the subjects included, the fact that it is written on paper which by the fifteenth century was already an accessible and cheaper product, the size of the volume, which is quite small as most notebooks were, the employment of

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293 Nevertheless, the copied texts can be more or less faithful to the original source or sources, showing corrections and additions to its recipes, which also demonstrates the state of knowledge and technology of the moment of the rewriting. This is the case of the texts that present emendations and additions, for instance, when unfamiliar words are glossed or substituted by local equivalents, particularly frequent in Italian and Spanish translations from Arabic into Latin which clearly struggle with the technical vocabulary. 

294 Clarke, The context of the Livro de como se fazem as cores, 51.

295 ibid, 54.
indicators for important issues, and the inclusion of some sketches (cf. chapter 7 § 4.1 and 4.2.2).

Another group of texts also relevant to the study of the Livro das Cores are alchemical texts. As Michela Pereira puts it, “[a]lchemy is the philosophical search for material perfection by means of manipulation of rough materials”[296]. In Europe, alchemy was introduced mostly due to translations from Arabic into Latin, but also “into and from Hebrew, sometimes with vernacular languages as intermediaries”[297]. Alchemical texts lived between the written Latin and the spoken vernacular, and mostly developed outside the academic circle. Moreover, it is possible to link the vernacularisation of alchemical texts to the spread of alchemical practices outside its original environments[298]. More than a craftmanship, medieval alchemy was a philosophical doctrine, the search for perfection through base materials. The most common indication of an alchemic text is precisely the combination of the spiritual with the practical, which translates itself in allegoric language and symbols[299]. This metaphorical language was usually employed to hide the true meaning or convey specific knowledge.

Despite the fact that there are no other Jewish technical texts for pigment preparation besides the Livro das Cores, there was some Jewish tradition in the alchemic arts, particularly in the Iberian Peninsula, influenced by Arab masters. A good example of such is the Hebrew version of the Book of Alums and Salts (Berlin MS 514), a translation and improvement of the original Arab text, attributed to Muhammed ibn Zakariyya al-Razi (864-925), although it is most likely to be a text from an anonymous alchemist from Spain, from the eleventh century[300].

3. Main features of medieval technical texts concerning colour preparation

Perhaps the most relevant aspect of the Livro das Cores for our present study is the determination of several parts within the text, which may correspond to at least two different

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[298] Robert Halleux apud Pereira, Alchemy and the use of vernacular languages, 339.

[299] Clarke, The Art of all colours, 36.

sources\textsuperscript{301}. This is not an exclusive feature but rather the prevailing pattern of medieval texts concerning the preparation of pigments and inks. From the fourteenth century onwards, long and coherent texts give way to collections and compilations of recipes and independent treatises, which increasingly replace earlier Latin texts.

About collections and compilations, they are randomly assembled or organised by theme, and frequently include extracts of older known texts in the form of translations or paraphrases that can be presented as reworked material. The very nature of recipes, in the sense that they are short texts, enables the process of selection, interpolation and reworking according to the specific interest or interests of the compiler, or of his audience. These features, together with the increase of the use of the vernacular (and consequent translation of older sources), contribute to the difficulty in determining the process of textual transmission\textsuperscript{302}.

Among the questions remaining to answer is to what extent the \textit{Livro das Cores} reflects workshop practices, and which new materials and processes are introduced. In the case of the \textit{Livro das Cores}, several codicological evidences support the idea of its practical use: the fact that it is written on paper\textsuperscript{303}, its format, the use of vernacular, or the fact that it is part of a general compilation of texts related to a specific subject. Yet, it may be more accurately associated with the whole environment of learning, that may include workshop but also classroom theory, especially if we consider the miscellaneous volume as a single unit.

Concerning the question of the introduction of new materials and techniques in fourteenth and fifteenth centuries technical texts, there is a visible increase of the number of used pigments, especially organic pigments for scribes and illuminators, although a large portion was previously known. As an example, ultramarine blue (chapter 4) began to be used in Northern Europe around the eleventh century, but the earliest records are from 100 to 150 years later.

Thus, it seems that late technical manuscripts, among them the \textit{Livro das Cores}, are a combination of compilation and adaptation of old material, which sometimes preserve the errors of the previous texts, and newly composed material that reflects personal knowledge.

\textsuperscript{301} Luís U. Afonso, “New developments in the study of \textit{O livro de como se fazem as cores das Tintas},” in \textit{The Materials of the Image} (Lisbon, University of Lisbon, 2010).

\textsuperscript{302} Also, the subsequent copy of such compilations by a single hand and the elimination of transpositions will give a uniform look to the new manuscript.

\textsuperscript{303} “Paper, rather than print, may be the key to the shift from reproducing old texts to producing new ones. In addition to making fair copies of manuscripts on parchment for preservation of a text for posteriority, paper ‘rough copy’ manuscripts are written for one’s own use, especially those in one’s own personal vernacular consisting of translations of extracts and new personal observations.” M. Clarke, \textit{The context of O Livro de como se fazem as Cores}. 

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4. The *Livro das Cores* and its possible sources

Considering that the most significant amount of recipe texts were written or compiled in the fourteenth and fifteenth centuries, we shall consider the following texts as possible sources underlying the text of the *Livro das Cores*:

4.1. Mappae Clavicula

Written between the ninth and tenth centuries and further expanded in the twelfth century, the *Mappae Clavicula* is closely related to the *Lucca Manuscript*, as it incorporates some of the same recipes. It denotes Oriental influences, particularly in terms of materials, but it is also connected to Northern Europe.

As for subjects, the *Mappae Clavicula* focuses on the arts of the painter, providing recipes dealing with metals, pigments and miscellaneous chemical operations. No doubt, it was one of the most copied texts during the Middle Ages and there are records of its presence in Portugal, as well as in Spain. There was a copy of the *Mappae Clavicula* in Coimbra, although there is no extant copy of it today. Records show that it was borrowed by Master Gil in 1218 at the Augustinian Canons monastery of Santa Cruz (Holy Cross). This monastery was one of the most important *scriptoria* in Portugal during the Middle Ages. The *Mappae Clavicula* in question was part of a miscellaneous volume, together with *Macer Floridus* by Otto de Meung and the *Liber Lapidum* by Marbodus, and other smaller texts.

There is no extant Portuguese copy of the *Mappae Clavicula*, yet records of its existence seem relevant enough to evaluate any possible influence in the *Livro das Cores*, especially considering the similarities in terms of structure and organisation. A study conducted by António João Cruz determined some similarities in terms of structure. Also, it established the comparison between some inorganic pigments to obtain five different artificial pigments or paints: mosaic gold, silver blue, red lead, verdigris and vermilion. Soon it was concluded that

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304 M. Clarke estimates that there are c. 100 texts from the fourteenth century and over 250 from the next century, whereas prior to fourteenth century the number is significantly smaller.
306 The *Codex Matritensis*, held at the Biblioteca de El Escorial, contains recipes from several sources, including the *Compositions variae* and c. 70 paragraphs from the *Mappae Clavicula*.
308 António João Cruz, “Em busca da origem das cores de “O Livro de Como se Fazem as Cores”: sobre as fontes de um recetário português medieval de materiais e técnicas de pintura”, in *The Materials of the Image* (Lisboa: Campo da Comunicação, 2010).
there was little in common, since, as expected, there is no reference to mosaic gold in the
Mappae Clavicula, and the procedures for the other pigments are significantly different. The
most relevant connection is the recipe for silver blue, although the procedure is not exactly the
same.

4.2. Schedula Diversarum Artium

The Schedula Diversarum Artium is a compilation of writings usually attributed to
Theophilus the Presbyter, even though there are reasonable doubts about this matter. The
Schedula was most likely prepared between 1100 and 1120. The work is divided in three
volumes. The first deals with the production and use of painting materials and techniques for
mural painting and book illumination.

There are no surviving copies nor records of the Schedula in Portugal. Yet, there are
eventual evidences such as the treatment of the human figures and the use of specific colours
(e.g. grey), in a manuscript of the Alcobaça monastery, and possibly others from another
scriptorium (Lorvão monastery). Also, there are some technical aspects of the working of gold
that follow the instructions provided in the Schedula.

It is possible to ascertain some similarities between the Livro das Cores and the Schedula
such as the application of metal foil to books; different glues for gold painting, particularly fish
glue (eel and conger-eel); tempering of pigments; and the choice of colours. Gold was the most
desired outcome in both texts and there are several recipes dealing with this subject.
Nevertheless, there is no recipe for mosaic gold in the Schedula, as it was mostly used from the
fourteenth century onwards. Also, there is no recipe for silver blue, but there are references to
indigo, which was a common dye. Another dye is turnsole, which may correspond to the
mysterious folium of the Schedula (there are three types of folium described: red, purple and
blue). Other similarities are of the preparation of synthetic vermilion, minium and verdigris.

Finally, regarding varnishes, Thompson\(^3\) suggests that the word “fornis” or “glassa”,
chapter 21 of the Schedula, must be closely related to the ingredient described in the Livro das
Cores as “garassa de nobra”, which, on the other hand, should be read as “grassa d’eneblo”\(^3\). Thompson further explains that the word “glassa” originally meant amber. This is, perhaps, the
most important similarity between both texts.

\(^4\) Ibid.
4.3. Texts of Jehan Le Begue

The texts of Jehan Le Begue consist of a number of texts dealing with art and craft techniques that were copied and compiled by Le Begue in 1431 in a single volume, with a preface and a glossary composed by him. The volume contains fragments of the *Schedula Diversarum Artium*, and the entire *De coloribus et artibus romanorum* (attributed to Eraclius). Among others, the following texts are included in this volume:

(i) *De coloribus faciendis*, written by Pietro de Santo Audemaro (fourteenth century);
(ii) *De coloribus diversis modis tractatur*, written by Johannes Alcherius, or Archeius (second half of the fourteenth century - first half of the fifteenth century);
(iii) *De diversis coloribus*, also written by Alcherius;
(iv) *Experimenta de coloribus*, compiled by Alcherius between 1409 and 1411, to which Le Begue added 50 recipes.

4.4. Segreti per Colori (Bolognese Ms.)

This text, written in Latin and Italian, was compiled by an unknown author in the second quarter of the fifteenth century. It deals with crafts and painting techniques. The manufacture of pigments, binders and varnishes are explained with some detail, and it presents some recipes for the preparation of *purpurinus* to imitate gold. The only extant copy is in Bologna, hence its name.

4.5. Strasbourg MS.

Written in the fifteenth century, the Strasbourg MS. is one of the oldest German texts on painting techniques. Kept at the Strassburger Stadtbibliothek, it was destroyed by a fire in 1870, but a copy had been previously made. It describes the preparation and grinding of pigments, miniature painting techniques, and the application of colours and varnishes and gilding techniques.

4.6. Cennino Cennini’s Il Libro dell’Arte

This is, clearly the best known source of medieval technology. Written in the 1390s by Cennino Cennini in Italian, this text is clearly a treatise, and it reflects fourteenth-century practices.
4.7. Montpellier Ms. H490

When examining the corpus of medieval European technical texts, it is strikingly noticeable the scarce (almost inexistent) number of original Iberian texts. The absence of such texts is only explained by the difficulty in finding them, as they are most frequently brief recipes included in texts of other natures, such as recipe books for botanics, dietetics, pharmacology, alchemy, economic and arithmetic texts, and medicine. This is precisely the case of the Montpellier Ms. H490, written for the most part in Spanish with some Latin additions. The manuscript was most likely written by Juan de Celaya between 1460 and 1480 in the intellectual centre that was the Salamanca University.

The Ms. H490 is a miscellaneous volume where it is possible to ascertain fragments from other manuscripts and several loose recipes on several technical subjects such as medical, alchemic and astrological texts, as well as a text from a Spanish Muslim author, Andallo Abensarón. More importantly, there is a collection of recipes for the dyeing of leather (fol. 222), and another group of 16 recipes related with the preparation of materials for book illumination. The first group, nine chapters, provides instructions for the dyeing of leather in black, “pardo”, green, yellow (twice), “cárdeno” (purple), “bermejo” (red) and blue (twice). The recipes give instructions on the colorants and the binders to be used, as well as a mordant.

The second group of recipes, and the most relevant for the study of the Livro das Cores, fills fol. 231v-233v. They are six recipes for the preparation of ultramarine blue (twice), mosaic gold, the preparation of size for the application of metal leaves, and a recipe for the preparation of black paint for writing. The first recipe for blue follows similar processes for the preparation of ultramarine blue as presented in the De Arte Illuminandi (from lapis-lazuli). A second one describes a very similar process to the Livro das Cores to obtain silver blue. Similarities continue, as the MS. H490 also presents a recipe for mosaic gold, and uses the same name as the text of the Cores: “aurum musicum”. The process described is similar to the one in the Livro das Cores. Finally, there is a recipe for black ink, but it has no parallel in the Cores.

The recipes of the Ms. H490 are written in a very practical and concise way, describing procedures similar to other European text of such kind, which is a sign of the practical use of
the volume. Also important is the strong influence of Arabic lexicon, especially for technical terms, another important similarity with the Livro das Cores (cf. chapter 11 § 3).

Even though there are no original texts for colour and pigment preparation from Spain, this does not exclude the presence of such technical texts in the country. In the Iberian kingdoms, similarly to what happened in Portugal, the main texts for colour and pigment preparation circulated since the early ages. An example of this is the Codex Matritensis, held at the Biblioteca Nacional de Madrid. Dating from c. 1130, the text possibly originated in Italy in the eight century. The text is in close relation with the Lucca manuscript and the Leyden papyrus X. This suggests a common late Latin or early Italian ancestor and, perhaps, Alexandrian roots. Along with the Codex Matritensis, there are also records of the Mappae Clavicula at the Biblioteca Nacional de Madrid.

In Portugal, apart from the Livro das Cores, and the records of the Mappae Clavicula, there are only a few ink recipes314. More recently, the study of the treatment of the human figures in an Alcobaça manuscript, as well as some metalwork linked to the same monastery, suggests that the Schedula Diversarum Artium was known in Portugal, although there are no surviving copies315.

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314 Maria José Santos, Da visigótica à carolina - a escrita em Portugal de 882 a 1172 (Lisboa: Fundação Calouste Gulbenkian, 1994).

315 This possibility was mentioned by Prof. Adelaide Miranda of the New University of Lisbon.
One of the most important features of the Livro das Cores is the fact that it is written in Portuguese with Hebrew script. Such combination is rare and raises important questions. In this chapter we evaluate the Livro das Cores in the context of Judeo-Portuguese. We begin by defining what is Judeo-Portuguese and the specificities of the texts included in the corpus. We further suggest additional texts that should be included in the corpus of Judeo-Portuguese. We outline the adaptation of Hebrew script in the Livro das Cores and compare it with other recipes included in the Ms. Parma 1959. Finally, we consider the underlying language (medieval Portuguese).

1. Judeo-Portuguese

Judeo-Portuguese can be defined as the language spoken by (i) Jews in Portugal, prior to 1496; (ii) by Jewish Portuguese descendants in Portuguese communities such as Amsterdam; and (iii) by marranos\(^{16}\) in Portugal and abroad. Of the language spoken by Jews in Portugal little is known. Regarding the second group, there is a fast assimilation of the Jewish Portuguese descendants into predominantly Spanish communities, which makes it a difficult task to know which linguistic elements are in fact Portuguese, due to the similarities between Castilian and Portuguese.

The best source about the language spoken in Portugal are a very limited number of texts written in aljamia, that is, Portuguese texts written with Hebrew script. In the identified corpus of Judeo-Portuguese there are two astrological texts, the Livro de Magika (Oxford, Bodleian Library, Ms. Laud. Or. 282) and the Libro kunprido enos guizos das estrelas (Oxford, Bodleian Library Ms. Laud. Or. 310); a medical recipe (Cambridge Univ. Library, Ms. Add. 639.5); two Passover texts (Oxford, Bodleian Library, Ms. Can. Or. 109, and Leeds, University Library, Brotherton Roth Ms. 71) contained within mahzorim, which present a few specificities\(^{17}\); and the Livro de Como se Fazem as Cores, which is considered the text containing the most varied linguistic corpus.

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\(^{16}\) Marranos are secretly practising Jews. In Portugal, there was a significant community in the area of Belmonte.

\(^{17}\) They consist in discontinuous texts with vernacular passages interrupted by blessings written in Hebrew, they incorporate Hebrew words, and they are the only texts to use a systematic diacritic vocalisation (niqqud). These features are, no doubt, due to the religious nature of the texts.
The nature of some of the texts is undoubtedly Jewish, as is the case of the two Passover texts described by Devon Strolovich\textsuperscript{318}. Yet, others such as the \textit{Livro das Cores}, that do not present a strong Jewish influence, raise the question of whether they should be considered as Judeo-Portuguese. So far, the graphical component of the \textit{Livro das Cores} has been considered reason enough to add it to the limited corpus of Judeo-Portuguese texts.

Clearly, the textual corpus of Judeo-Portuguese is strikingly small, especially when compared with Judeo-Spanish and with other Jewish dialects. As we mentioned before, this is in part due to the assimilation into predominantly Spanish communities, but also due to the constant erroneous classification of Portuguese texts as Spanish. One of the Passover texts was initially catalogued as being Spanish, which is the same case of the recipes included in the Ms. Parma 1959, that are catalogued as being Spanish, when in fact they are written in Portuguese (or perhaps Galician-Portuguese).

Thus, considering the Hebrew graphical component as one of the main features, we wish to add the following texts to the corpus of Judeo-Portuguese and discuss them\textsuperscript{319}:

\subsection*{1.1. Two texts included in the Vat. ebr. 372\textsuperscript{320}:}

\subsubsection*{1.1.1. “Necessario” (foll. 1r-84r)}

In the first part of the Vat. ebr. 372 is included a medical treatise described as Galician-Portuguese, even though it most likely is Portuguese, as the misconception of what is in fact Portuguese is common. It is divided in five parts, and the last part shares some recipes with the M-FA-14 (Porto, Biblioteca Pública Municipal).

\begin{quote}
“\textit{Aqui começa o necessário eu que compus maestro Samuel Esperel ao meu mestre David Serogano (cirurgião??) de Jaen}.”
\end{quote}


\textsuperscript{319} Inês Vilela-Petit also makes reference to two other \textit{aljamiado} texts: hébr. 215 (BnF, Paris) and hébr. 689 (BnF, Paris): “Les Recettes pour l’enluminure. Do Livro judaico-português de como se fazem as cores.” \textit{Medievalista online} 9 (2011): note 11. We, however, have not yet been able to confirm it.

\textsuperscript{320} Benjamin Richler, Malachi Beit-Arié and Nurit Pasternak (eds.), \textit{Hebrew Manuscripts in the Vatican Library Catalogue} (Jerusalem: Jewish National and Library University, 2008).
1.1.2. Additional medical recipes (foll. 84r-92r)

These recipes are also described as being written in Galician-Portuguese. The colophon (fol. 84r) states that it was copied by Joseph Catelan for his own use:


“İsto libro (dispositora e) necessario e de Yosef Catelan o moço e por sair certo assinei aqui meu nome Yosef Catelan <ASSINATURA>

fol. 84r

The incipit provided in the catalogue is in Hebrew:

SELECTED PROPERTIES THAT I YOSEF THE DOCTOR CALLED CATELAN TRIED SEVERAL TIMES IN MANY DISEASES.

1.2. Assorted recipes (Ms. Parma 1959, foll. 28v and 79r)

These recipes have mistakenly been identified as Spanish. They are written in cursive script and we were able to identify several handwritings. We have already discussed them in previous chapters, and we provide a transliteration and translation on appendix D.

1.3. M-FA-14 (Porto, Biblioteca Pública Municipal)

This text is listed as an ophthalmological treatise and it is already mentioned in relation to the corpus of Judeo-Portuguese324. However, the reading of the text allowed us to establish that, in fact, this is not an original text but rather a transliteration of the *Thesaurus Pauperum*, a medical treatise or compilation accredited to Petrus Hispanus. The *Thesaurus Pauperum* was widely known in the Middle Ages. Essentially, it is a compilation of treatments prescribed by several authors (among them a few known Jewish doctors). Although some of the procedures described are symbolic, the author endorses their effects.

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324 D. Strolovich makes no reference to it, but it is mentioned, for instance, in the Jewish Language Research Website (http://www.jewish-languages.org/judeo-portuguese.html).
The *Thesaurus Pauperum* was most likely written in Latin and subsequently copied and translated into Portuguese, Italian, Spanish, French, German and, among several other languages, to Hebrew. This is not at all surprising if we consider that medicine was a common occupation among Jews in the Middle Ages. In Portugal alone there are records of 38 Jewish doctors in Lisbon and 24 in Porto, and over 30 doctors and five surgeons working simultaneously, during the fifteenth century. This was also reflected in terms of book production, with many medical and scientific works being copied (cf. chapter 2 § figure 2.3).

There is no doubt that Hispanus’ *Thesaurus Pauperum* was widely known in Portugal and it was translated into the vernacular. The *aljamiado* text held at the Biblioteca Municipal do Porto seems to be based on the Portuguese version of the text. Before the text it is included a description of the transliteration system used in the *Thesaurus Pauperum*, which clearly suggests that the text is a copy of a Portuguese translation. This version of the *Thesaurus Pauperum* is very interesting, as there were Portuguese and Hebrew translations available, and Jewish doctors were certainly capable of reading both languages.

Similarly, it is strong the possibility of the *Livro das Cores* being the transliteration of a previously existing vernacular text (whose original copy is now lost). A few other features are common to both texts: there is no particular Jewish influence noticeable in the texts, they are written on paper with a careful Hebrew semi-cursive script with no mistakes. In fact, all of the previously mentioned Judeo-Portuguese texts are written on paper. The two texts share a similar and well-organised structure with a prologue and chapters divided by enlarged Hebrew letters corresponding to the chapter number written in semi-cursive script, and both texts denote an Arabic influence, most likely due to their original sources.

2. Portuguese language and Hebrew script

Hence, it seems that one of the most distinctive features of Judeo-Portuguese is the use of the Hebrew script. Yet, and despite a “well-elaborated product of script adaptation”322, it is still possible to notice some (apparent) variety of transliterations. Strolovich emphasises that Judeo-Portuguese is a synthesis of influences and not merely a system of phonetic transcription, thus considering the following aspects within Judeo-Portuguese writing system:

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2.1. Independence from Hebrew orthography

Similarly to other adaptations of Hebrew script, in Judeo-Portuguese three Hebrew characters (ן, י, ט) are used to transcribe the five Portuguese vowel letters, except for /a/, that is sometimes omitted (e.g.: pr¬nétªs). In the case of the Livro das Cores /a/ is seldom omitted, with the exception of Arabic words.

In the case of similar phonetic values such as ר/ו, י/נ, one of the two Hebrew letters is omitted. In the Livro das Cores and in the recipes (foll. 28v and 79 in the Ms. Parma 1959), /k/ is always represented by כ and never by ט. Yet, the same does not apply to ט/ו, as both are employed with specific meanings. Also, there is no use of the pharyngeal fricatives ר נ and ט.

2.2. Adaptations based on Hebrew orthography

Another feature of Judeo-Portuguese is the “innovative carryovers from Hebrew writing, in that they have neither Roman-letter analogues nor Romance language motivation”323. This is seen in the spelling of /a/ in word-final syllables (e.g. “עאח” > יי יאח), which is a direct imitation of the Hebrew language, where words ending in /a/ are usually spelled with הנ (which in other positions הנ represents /h/, although in Portuguese there is no such phoneme). Since Hebrew has no absolute-initial vowels, a single י or י is read as a consonant, unless preceded by ר, which, in this case, indicates a vocalic sound (e.g., eu > יי יאח). Even for /a/ this is also valid (אוטונוס [outonos] > מטונינא), although not always (אוכמיסאי [comecei] > מטונינא).

2.3. Adaptations based on Roman-letter orthography

“Beyond the categorical adoption of vowel letters, the clearest way in which Judeo-Portuguese shows evidence of its writers’ bi-literacy is in deploying pairs of Hebrew letters to reflect distinctions not necessarily maintained in speech nor, curiously enough, in the contemporary Roman-letter spelling of Portuguese”324 (e.g. /v/ may be spelled י or ו, as well as by ט with or without diacritics). The choice of transliteration seems to be associated with the etymology of the word, and it is not always consistent.

323 Ibid, 35.
324 Ibid., 36.
Another feature of Judeo-Portuguese is the preference for ψ instead of ɔ, the “default” sibilant for representing /s/, although in the Livro das Cores there is a third option, the use of Ϛ. Strolovich establishes that ɔ is mostly used for words of non-Latin origin, or to spell the Portuguese sibilants that occur in nativised loan-words. Hence, the use of ɔ most frequently corresponds to <c> or <ç> before a non-front vowel, while ψ represents only those sibilants that were spelled by a single <s> in Latin orthography.

2.4. Adaptations based on Arabic orthography

The influence of Arabic writing is mostly circumscribed to loan-words of Arabic origin, essentially in the Livro das Cores. The writers of Hebraicised Portuguese “borrowed conventions from Semitic writing beyond Hebrew that enable both etymological and quasi-etymological spellings not captured (or even capturable) by the conventional Roman-letter orthographies”325. That is, Judeo-Portuguese maintains the orthographic distinctions that have been erased in the Roman-letter spelling by drawing on Hebrew.

For instance, the Hebrew alphabet allows Judeo-Portuguese to maintain etymological distinctions such as z/s in Arabic that are not significant in Portuguese. Another example is the correspondence of the Hebrew ו and י, that correspond to the Arabic ÿ and ﺔ (for instance, the word almofariz (mortar) is written as אלמופארז from the Arabic “al-miḥraṣ”.

Another important aspect in the loan of Arabic words in the lack of representation of /a/, which is justified by the absence of vowel letters in the original Arabic word.

3. Adaptation of Hebrew script in the Livro das Cores

Throughout the Livro das Cores (and in the recipes in Portuguese included in the Ms. Parma 1959), there is a reasonably coherent writing system, described in the following table:

325 Strolovich, Old Portuguese in Hebrew Script, 108.
<table>
<thead>
<tr>
<th>Hebrew</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>א</td>
<td>(i) glottal stop before י and י</td>
</tr>
<tr>
<td></td>
<td>(ii) /a/</td>
</tr>
<tr>
<td>ב</td>
<td>(i) /b/</td>
</tr>
<tr>
<td></td>
<td>(ii) /v/</td>
</tr>
<tr>
<td>ג</td>
<td>(i) /g/</td>
</tr>
<tr>
<td></td>
<td>(ii) ‘ג as /f/</td>
</tr>
<tr>
<td></td>
<td>(iii) ‘ג as /dʒ/</td>
</tr>
<tr>
<td>ד</td>
<td>/d/</td>
</tr>
<tr>
<td>ה</td>
<td>final /a/</td>
</tr>
<tr>
<td>י</td>
<td>(i) /u/, /o/ (preceded by נ)</td>
</tr>
<tr>
<td></td>
<td>(ii) /v/</td>
</tr>
<tr>
<td></td>
<td>(iii) ¬ as /v/</td>
</tr>
<tr>
<td>ز</td>
<td>(i) /z/</td>
</tr>
<tr>
<td></td>
<td>(ii) /dz/</td>
</tr>
<tr>
<td>ה</td>
<td>/t/</td>
</tr>
<tr>
<td>ו</td>
<td>(i) /j/, /ɡ/ (preceded by נ)</td>
</tr>
<tr>
<td></td>
<td>(ii) /j/</td>
</tr>
<tr>
<td>כ</td>
<td>/l/</td>
</tr>
<tr>
<td>ל</td>
<td>/m/</td>
</tr>
<tr>
<td>נ</td>
<td>/n/</td>
</tr>
<tr>
<td>ס</td>
<td>/n/</td>
</tr>
<tr>
<td>ע</td>
<td>(i) /s/</td>
</tr>
<tr>
<td></td>
<td>(ii) /ts/</td>
</tr>
<tr>
<td>צ</td>
<td>(i) /s/</td>
</tr>
<tr>
<td></td>
<td>(ii) /ʃ/</td>
</tr>
<tr>
<td></td>
<td>(iii) /z/</td>
</tr>
<tr>
<td></td>
<td>(iv) /dʒ/</td>
</tr>
<tr>
<td></td>
<td>(frequently, but not consistent! with a diacritic, though not the rafēh( רופ) )</td>
</tr>
<tr>
<td>נ</td>
<td>/ʃ/, in words that usually end in &lt;z&gt; (dez)</td>
</tr>
<tr>
<td>ק</td>
<td>/k/</td>
</tr>
<tr>
<td>ר</td>
<td>/r/</td>
</tr>
<tr>
<td>ש</td>
<td>(i) /s/</td>
</tr>
<tr>
<td></td>
<td>(ii) /ʃ/</td>
</tr>
<tr>
<td></td>
<td>(iii) /z/</td>
</tr>
<tr>
<td></td>
<td>(iv) /dʒ/</td>
</tr>
<tr>
<td>ת</td>
<td>/t/</td>
</tr>
</tbody>
</table>

Table 10.1. Transliteration system employed in the Livro das Cores
As we have previously mentioned, the three recipes in appendix D use a similar writing system. They are close to the *Livro das Cores* due to their subjects, and the first recipe (stag’s horn glue) shares similarities of adaptation of Hebrew script, the existence of a final sign that also is included in the *Livro das Cores* and palaeographic similarities, especially compared with catchwords in the *Livro das Cores*.

4. Medieval Portuguese

According to Devon Strolovich, the writing system of Judeo-Portuguese captures the language, in whatever indirect fashion, at a more recent stage in its history. Ivo de Castro also suggests the existence of ‘linguistic layers of different chronology’ in the text of the *Livro das Cores*. Despite the immediate temptation to consider any Hebrew (and Jewish) elements of the *Livro das Cores*, this text is primarily an important document of Portuguese language, and the “most conspicuous contribution of the Judeo-Portuguese corpus to the history of Portuguese”.

In their study on the *Livro das Cores*, António João Cruz and Luís Urbano Afonso suggest that 50 percent of a set of 122 words was only used in the fifteenth century. Castro, on the other hand, underlines the existence of vocabulary from distinct periods, available to be included in the text of the *Livro das Cores*, and makes a few remarks about the vocabulary analysed.

Castro also refers to some phonetic specificities, such as the option for the use of 1 in the beginning of words such as ‘vinagre’ and 2 to represent the affricate /β/, ‘ovo’ [oβo] and the bilabial stop /b/, ‘bacio’. The author further explains that the confusion between the fricative /v/ and the stop /b/ constitutes one of the traits of the northern Portuguese dialects.

Even though we do not possess the necessary knowledge to evaluate the impact of dialects or any linguistic substrata underlying the text of the *Livro das Cores*, nor is that the

316 Strolovich, *Old Portuguese in Hebrew Script*.
318 Strolovich, *Old Portuguese and Hebrew Script*, 351.
330 Affricates are consonants such as [t] or [d] that begin as stops but are immediately followed by a fricative.
331 We should mention what it seems to be a misspelling of Hebrew in the text of Ivo de Castro, most likely due to the difficulty of writing in Hebrew in a Roman-letter context.
334 Castro, *Notas sobre a língua do Livro de como se fazem as cores*, 89.
main purpose of our thesis, there are other linguistic traits that can be interpreted as traces of
galician-portuguese or, perhaps, may suggest some association with the northern Portuguese
dialects. We were particularly sensitive to this possibility due to the suggested connection to the
Kennicott Bible that was copied in La Coruña, and whose recipient was Isaac ben Solomon
de Braga, which must be the northern city in Portugal:

(1) Phonetic traits such as the use of the fricative /s/ instead of /z/ in words like
“rosa” (רזה ), which are typical in Galician dialects;
(2) also, the word ‘cor’ is treated as masculine;
(3) the use of the affricate [dʒ] in words such as ‘tijela’;
(4) the more frequent use of the verb ‘haver’ instead of ‘ter’ (although this is not a
particularly distinctive trace);
(5) the employment of some vocabulary most common in the north: ‘ervanço’,

Finally, and considering the most likely possibility of the Livro das Cores included in the
Ms. Parma 1959 being a copy of a previously existing text, we would like to mention some
features in the Livro das Cores that may point to the copy from a written text:

(1) the consistent writing of words ending in <z> such as ‘dez’ and ‘verniz’ with й, when
phonetically it should be transliterated as ψ (that is, in words that are not originally Arabic);
(2) the updating of the orthography, as suggested by Castro;
(3) and most importantly, the traces of thirteenth and fourteenth century Portuguese
language, conjugated with fifteenth century traits.

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333 This possibility was first suggested by David Blondheim, “An Old Portuguese work on manuscript illumination,”
335 Castro, Notas sobre a língua do Livro de como se fazem as cores, 93.
In this chapter we evaluate the possible reasons for the aljami吗 writing of the Livro das Cores. To evaluate these possibilities we propose the analysis of the textual structure of the Livro das Cores. We also evaluate some linguistic specificities such as the presence of alchemic language and lexical borrowings from Arabic. We have based our study in the consult of the photographs of the text, as well as in the transliterations and translations of Devon Strolovich, David Blondheim and Artur Moreira de Sá.

1. General overview

The most recent study on the Livro das Cores, raises three possibilities for the use of Hebrew script and we shall try to evaluate them:

1. the original text (or the source of the extant copy) was already written in aljami吗, that is, a Portuguese text written with Hebrew characters, although this does not answer to the question of the origin of such source;

2. the writing in aljami吗 is due to the desire to keeping the text secret to others than those who were literate in both writing systems;

3. it was a way to keep the accuracy of the original source, more specifically, in terms of technical terminology.

2. Textual organisation of the Livro das Cores

The Livro de Como se Fazem as Cores das Tintas is divided in 45 chapters of different lengths, each usually corresponding to a single recipe, although a few chapters suggest

variations for the initial colour\textsuperscript{340}. In his recent study, Luís Afonso determines the division of the Livro das Cores in three parts\textsuperscript{341}: (i) from the beginning of the text to chapter 15; (ii) chapters 16 to 24; (iii) chapters 25 to the end. Afonso argues that there is some duplication of procedures of the first half in the third part, as well as some linguistic specificities such as the predominance of Arabic terms in the second part, or of Portuguese terms in the third.

Also corroborating the suggested division is the identification of two incipits in the text, one in the beginning of the text and another on chapter 25. The first begins with “Here begins the book...”, followed by the explanation of the contents of the book and an exhortation to follow exactly the given instructions. In addition, the first recipe begins with the adverb “firstly”. According to Afonso, a new textual beginning is marked by the existence of a second incipit on chapter 25 where there is a description of the subsequent variety of procedures. Similarly to the first incipit, this is followed by the adverb “firstly”\textsuperscript{342}.

\begin{table}[h]
\centering
\begin{tabular}{|p{0.4\textwidth}|p{0.4\textwidth}|}
\hline
aki se.komeinha o livro de komo se fazen as kores das tintas todas pera aluminar os livros e digamos logo primeira mente do oro sol. (…) primeira mente tomaras def onças de -gupiter…
\hline
Here begins the book on how to make colors of all shades for illuminating books. And let us talk first about gold (sol). (…) First of all take ten ounces of Jupiter…
\hline
\end{tabular}
\end{table}

\begin{table}[h]
\centering
\begin{tabular}{|p{0.4\textwidth}|p{0.4\textwidth}|}
\hline
kein ki-ser obrar kon oro o kon otras kores e komo se deven afazer e ameçkar por este in-genyo o deven afazer ke e -gah probado primera mente quando o oro ki-seres poer toma okre e o avvalade tanto de un komo de otro e un pokó de -gíb e todas koisas a-gunta-as en uo e moyas todas muyto e muy bein kon krara…
\hline
Whoever wishes to work with gold or other colors, and how they should be made and mixed, it should be done this way, which is already well tested. First, when you wish to apply gold, take ocher and white lead, as much of one as of the other, and a little chalk, and mix all these things together and grind them thoroughly and very well with egg-white…
\hline
\end{tabular}
\end{table}

However, in our analysis of the text of the Livro das Cores we found a recurrent sign that may indicate a different division from the one established by Afonso:

\textit{(1)} The first sign, figure 11.1, appears at the end of chapter 16, right before the beginning of chapter 17. Due to the position of the sign (in the middle of the text), we can assume that despite the separation, the text must be viewed as continuous (that is, parts are subsequent).

\textsuperscript{340} This is particularly the case in the third part of the Livro das Cores. As an example, chapter thirty-five suggests several mixtures in order to produce different colour shades.

\textsuperscript{341} Afonso, \textit{New developments in the study of} O livro de como se fazem as cores das tintas, 10.

\textsuperscript{342} Ibid., 9-10.
(2) There is a similar sign on the catchword on fol. 12v. The sign is cut, suggesting the trimming of the paper. It is preceded by the catchword indicating the first word in the next page. Due to the fact that this is a folio missing, it is possible that the inclusion of the sign indicates the ending of the second part, between chapters 22 and 23 in the missing page:

![Fig. 11.2. Sign at the catchword (fol. 12v)](image)

(3) A similar sign is found at the end of chapter 40 (fol. 18r), in the middle of the lower margin. The localisation of the mark suggests the conclusion of the text, similarly to what happens in the first recipe on fol. 28v:

![Fig. 11.3. Sign at the end of chapter 40 (fol. 18r)](image)

(4) Another sign in the catchword on fol. 18v. The sign is placed above the catchword. So far, we cannot explain the inclusion of the sign before the catchword, although one possible explanation is that it marks the initial limit of the text (in reference to the sign in the previous page) and the continuation to the next page:
(5) Finally, the same sign appears at the end of the first recipe on fol. 28v:

Along with linguistic specificities, this suggests a possible relationship between the Livro das Cores and this first recipe. Also, and despite the recipe is written in cursive script, there are similarities in both handwritings (cf. chapter 6 § 4.3), more specifically between catchwords on the Livro das Cores, written in a more cursive style, and the first recipe on fol. 28v.

Hence, based in these marks, we suggest the following textual division, which can also be attributed to more than two different sources:

2.1. Part One (1 – 16)

<table>
<thead>
<tr>
<th>Intended result</th>
<th>Recipe</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>- mosaic gold</td>
<td>(1), (2)</td>
</tr>
<tr>
<td></td>
<td>- binders for the application of gold leaf in books</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>- grinding gold</td>
<td>(4)</td>
</tr>
<tr>
<td>Blue</td>
<td>- silver blue</td>
<td>(5), (6), (7)</td>
</tr>
<tr>
<td></td>
<td>- tempering blue</td>
<td></td>
</tr>
<tr>
<td>Rose</td>
<td>- from brazilwood</td>
<td>(8), (9)</td>
</tr>
<tr>
<td>Orange</td>
<td>- minimum</td>
<td>(10),</td>
</tr>
<tr>
<td>Green</td>
<td>- verdigris</td>
<td>(11), (12)</td>
</tr>
<tr>
<td>Carmine</td>
<td>- lac</td>
<td>(13), (14)</td>
</tr>
</tbody>
</table>
The presence of recipes for mosaic gold has been pointed out as one of the most important features of the Livro das Cores (cf. chapter 12 § 2.1.1). In this part, especially in the first recipes, there is some alchemic language (“sun” instead of gold, and other elements that will be further discussed). Also, in this first part of the text there is an interesting mechanism of explanation by using a corrupted Latin expression, id es(t) in order to give a synonym of the previous term. This Latin expression is exclusively used in the recipes where there are some alchemic traces, whereas in other recipes other forms of explanation are used:

<table>
<thead>
<tr>
<th>Intended result</th>
<th>Recipe</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>- vermillion</td>
<td>(15),</td>
</tr>
<tr>
<td>Laying gold on swords and knives</td>
<td></td>
<td>(16),</td>
</tr>
</tbody>
</table>

Table 11.1. Description of the contents of Part One of the Livro das Cores

One question that poses following this division is the connection of chapter 16 with the rest of Part One, as most recipes deal with the preparation of pigments for book illumination. Still, and in addition to the sign deal with this first part, its exclusion from Part Two allows it to have a single subject: the dyeing of objects of wood and bone.

2.2. Part Two (17 – 22/23)

The second part of the Livro das Cores is the most coherent one, dealing exclusively with the dyeing of wood and bone. This part is incomplete, as the folia with chapters 22 and 23 is not included in the volume, and chapter 21 is incomplete. Similarly to Part One, the technical vocabulary denotes a strong Arabic influence.

Table 11.2. The use of id es(t)³⁴³

<table>
<thead>
<tr>
<th>Intended result</th>
<th>Recipe</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- black</td>
<td></td>
<td>(17),</td>
</tr>
</tbody>
</table>

³⁴³ We have opted to omit another possible use of id es(t) in chapter twenty-nine, as it is ambiguous.
### Intended result

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Recipe</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyeing bone and wood</td>
<td>- red</td>
<td>(18),</td>
</tr>
<tr>
<td></td>
<td>- black</td>
<td>(19),</td>
</tr>
<tr>
<td></td>
<td>- green</td>
<td>(20),</td>
</tr>
<tr>
<td></td>
<td>- black and white</td>
<td>(21),</td>
</tr>
</tbody>
</table>

Table 11.3. Description of the contents of Part Two of the Livro das Cores

2.3. Part Three (24 – 40)

The third part of the Livro das Cores deals mostly with colour tempering, a subject also covered in Part One. The second half of Part Three deals with colour shades and variations, as well as some technical procedures, in specific, mordants.

<table>
<thead>
<tr>
<th>Intended result</th>
<th>Recipe</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tempering</td>
<td>- mulberry/purple (preparation and tempering)</td>
<td>(24),</td>
</tr>
<tr>
<td></td>
<td>- gold</td>
<td>(25),</td>
</tr>
<tr>
<td></td>
<td>- blue</td>
<td>(26), (29), (34)</td>
</tr>
<tr>
<td></td>
<td>- rose (preparation and tempering)</td>
<td>(27),</td>
</tr>
<tr>
<td></td>
<td>- green</td>
<td>(28),</td>
</tr>
<tr>
<td></td>
<td>- carmine and carmine variants</td>
<td>(30),</td>
</tr>
<tr>
<td></td>
<td>- saffron and saffron variants</td>
<td>(31),</td>
</tr>
<tr>
<td></td>
<td>- orpiment</td>
<td>(32),</td>
</tr>
<tr>
<td></td>
<td>- black indigo</td>
<td>(33),</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mixture and mordants</th>
<th>Recipe</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- shades of blue, red and vermilion</td>
<td>(35),</td>
<td></td>
</tr>
<tr>
<td>- preparation of a mordant for gold leaf</td>
<td>(36),</td>
<td></td>
</tr>
<tr>
<td>- pigment mixtures</td>
<td>(37),</td>
<td></td>
</tr>
<tr>
<td>- apply gold to books</td>
<td>(38),</td>
<td></td>
</tr>
<tr>
<td>- burnish gold and silver</td>
<td>(39),</td>
<td></td>
</tr>
<tr>
<td>- parchment glue</td>
<td>(40),</td>
<td></td>
</tr>
</tbody>
</table>

Table 11.4. Description of the contents of Part Three of the Livro das Cores

Chapter 27 is somewhat distinct, as it is divided into sections. It describes the preparation of rose from brazilwood, “coor india” (“Indian colour”) and its variations. This is followed by a description of the “ten principal colours”:  

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It is curious the fact that 11 rather than ten colours are described. This was evaluated by David Blondheim, who translates azure instead of blue\textsuperscript{344}. Some authors point to the possibility that sufi and carmine being a single colour\textsuperscript{345}, and Espinosa Villegas suggests that it must be an archaic form of the Galician and Castilian word, originally Arabic, “zupia” (“sopié”, “sapa”). It designates the must “que ha conocido sólo la mitad, a un vino turbio que contiene poso, o incluso, a ese mismo poso de heces del vino”\textsuperscript{346}. This way, sufi or sufye would mean a colour within the range of carmine. Nevertheless, we should point out that the only conjunction in this sentence connects “orpiment” with “vermilion”. This could be red orpiment (realgar) or purpurinus, which in this case, may be a reference to mosaic gold. Another possibility, pointed by Blondheim\textsuperscript{347} and Strolovich\textsuperscript{348}, is that “sufi” may be referring to a reddish wool wore by members of the Sufi sect of Islam.

2.4. Part Four (41 – 45)

This last part is the shortest. There is no specific theme and it comprises several subjects. The last recipe is especially interesting, making a clear reference to chapter 24: “do as you did with the sunflower [juice] and urine”.

<table>
<thead>
<tr>
<th>Intended result</th>
<th>Recipe</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>mixture and tempering</td>
<td>- ochre</td>
<td>(41).</td>
</tr>
<tr>
<td>varnish preparation</td>
<td>- varnish</td>
<td>(42).</td>
</tr>
<tr>
<td>glue</td>
<td>- for gold</td>
<td>(43).</td>
</tr>
<tr>
<td>grinding and tempering</td>
<td>- rose</td>
<td>(44).</td>
</tr>
<tr>
<td>dyeing</td>
<td>- green</td>
<td>(45).</td>
</tr>
</tbody>
</table>

Table 11.5. Description of the contents of Part Four of the Livro das Cores

\textsuperscript{344} Blondheim, An Old Portuguese work on manuscript illumination.

\textsuperscript{345} ibid; Strolovich, Old Portuguese in Hebrew Script.


\textsuperscript{347} Blondheim, An Old Portuguese work....

\textsuperscript{348} Villegas, O livro de como se fazem as cores.
3. Arabic substrate

In the first two parts of the Livro das Cores, there is a strong Arabic influence in terms of technical vocabulary, whereas in the other two parts there are only a few words worth mentioning. On table 11.6, we list the majority of these words:

<table>
<thead>
<tr>
<th>Arabic words in the Livro das Cores</th>
<th>meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1). azogue (az-za’wq)</td>
<td>mercury</td>
</tr>
<tr>
<td>(1), (16), (20) anoxtar (al-nusadir)</td>
<td>sal ammoniac</td>
</tr>
<tr>
<td>(1) almofariz (al-miharas)</td>
<td>mortar</td>
</tr>
<tr>
<td>(10) azarcon azarcão (zarqun)</td>
<td>red lead</td>
</tr>
<tr>
<td>(10) alvaialde (al-bayad)</td>
<td>white lead</td>
</tr>
<tr>
<td>(19) azarnefe (az-azarniy)</td>
<td>arsenic or orpiment</td>
</tr>
<tr>
<td>(19) almartaque (al-martak)</td>
<td>silver litharge</td>
</tr>
<tr>
<td>(19) azeche (al-zaj)</td>
<td>vitriol</td>
</tr>
<tr>
<td>(16), (20) azinhavre (al-zinjar)</td>
<td>cinnabar</td>
</tr>
<tr>
<td>(21) axedres (satranj)</td>
<td>chess</td>
</tr>
<tr>
<td>(21) alfadida (al-hadida)</td>
<td>copper oxide</td>
</tr>
<tr>
<td>(26) alvagen</td>
<td></td>
</tr>
<tr>
<td>(27) çufi, sufii, sufye (sufi)</td>
<td>carmine or red orpiment</td>
</tr>
<tr>
<td>(17) alcrevite (al-kribit)</td>
<td>sulphur</td>
</tr>
<tr>
<td>(18) alcar</td>
<td>lac</td>
</tr>
<tr>
<td>(42) anil (an-nil)</td>
<td>indigo</td>
</tr>
</tbody>
</table>

Table 11.6. List of Arabic words

It is difficult to establish whether these words are the result of a translation from a direct Arabic source or if they are borrowings (direct and indirect). Still, this is easily understood if we consider that there is a strong influence of Arabic vocabulary in medieval Portuguese and Castilian language, particularly in terms of technical vocabulary.

349 The Arabic definitions and transliterations follow Miguel Nimer, Influências Orientais na Língua Portuguesa (São Paulo: EDUSP, 2005) and Felipe Maillo Salgado, Los Arabismos del Castellano en La Baja Edad Medieval (Salamanca: Ediciones de la Universidad de Salamanca, 2005).

4. Alchemic language in the Livro das Cores

Even though alchemic language in the Livro das Cores is mostly residual, we would like to consider it, as alchemy was a major interest of Jewish medieval scholarship, notwithstanding its more common association with Arab authors. Alchemical literature was widely available in the Iberian Peninsula, and there are many translations of the most important works. A good example is the Hebrew translation of the Book of Alums and Salts, attributed to al-Razi, that, according to Julius Ruska, was written in Spain in the twelfth century351. This book is particularly interesting, as it presents the chemical recipes in a very simple and practical way, devoid of the traditional secret and mysterious alchemic language.

There is no direct evidence of alchemy in the Livro das Cores, and all procedures and materials are real. Yet, there are a few elements worth mentioning: for instance, the frequent substitution of the metals by the name of planets: sun (“sol”) for gold, chapter 1, jupiter (“jubiter”) for tin, chapter 3, and moon (“luna”) for silver, chapter 5352. The same does not happen for other metals such as copper (venus) or quicksilver (mercury). Also, António João Cruz and Luís Afonso suggest that the expression “saca tua obra” is a reference to the Great Work, and the mention of a glass dome353 is more in context with laboratory utensils than with a workshop354. Afonso further suggests the process of indirect heating in some recipes is equally more typical of a lab than a painter’s workshop355.

To these already mentioned aspects, we add a few more: some interesting expressions such as “que não a diavlo que lhe tolha pre uz a color356” (chapter 12), and “se a for mui puro e mui limpo de toda a maldade” (chapter 26). Also, a few other words such as “umor”, chapter 15, a word closely connected to the theory of humours357, and the reference to Armenian salt instead of ammoniac salt.

352 According to A.-J. Cruz, the same happens in the manuscript of Jehan Le Begue, where the metals are identified by the planets, as was common in alchemic texts, but not in technical texts for painting: “Em busca da origem das cores de “O Livro de Como se Fazem as Cores”: sobre as fontes de um receituário português medieval de materiais e técnicas de pintura”, in The Materials of the Image, (Lisboa: Campo da Comunicação, 2010).
353 Also, a reference to a glass furnace, on chapter ten.
355 Afonso, New developments in the study of O livro de como se fazem as cores das tintas, 7.
356 tolher (gal.-port.): take, cause damage; pre uz (gal.): cloth (“fino tecido”). It must correspond to the contemporary Portuguese expression “não vá o diabo tecê-las”.
357 We should note that in other recipes vapour is mentioned as “bafo”. In the Middle Ages, it was thought that the interaction of the four basic “humours” defined all health states: blood, mucus, yellow bile and black bile (or melancholia). This is similar to the alchemic theories.
In this chapter we propose the analysis of the recipes included in the Livro das Cores, taking into account the intended results, the procedures and materials used to obtain them. We also evaluate the particularities of some recipes. The main purpose of this study is to contribute to the evaluation of the possible use of the Livro das Cores in the illumination of Hebrew manuscripts of Portuguese origin.

1. The palette of the Livro das Cores

The idea of a direct correspondence between chapters and recipes is applied in most of the Livro das Cores, although in the third section some recipes include more than one procedure. For instance, chapters 37 and 39 suggest five and three colours, respectively. As described in appendix G § G.1, there are 47 procedures detailed in the 45 chapters of the Livro das Cores. These procedures envisage the production of a significant variety of colours, and they give details to several other technical procedures such as the manufacture of glue and varnish.

![Figure 12.1. Distribution of pigments in the recipes of the Livro das Cores](image)

Figure 12.1. Distribution of pigments in the recipes of the Livro das Cores
Considering the intended results (appendix G § G.2), for both book illumination and dyeing of objects made of wood and bone, it is possible to conclude that:

(1) blues have the same weight as yellows and gold in the total of the recipes (26 percent);
(2) reds and roses together are predominant (30 percent);
(3) a large portion of the procedures dealing with blue concern the tempering of the pigments;
(4) rose is exclusively prepared out of brazilwood;
(5) the most common green is verdigris;
(6) black is almost exclusively dealt with in the second section of the Livro das Cores, in the context of dyeing objects of wood and bone.

2. Colours and procedures

2.1. Gold and yellows

There is no doubt that the most important desired outcome described in the Livro das Cores, is gold or gold imitation, since over 30 percent deal with this subject. As the prologue immediately informs, all instructions must be strictly followed to obtain the intended result, of which gold is the most important:

“And let us talk first about gold (sol). If you wish to make gold with which you can illuminate or paint or capitalise or write, as this book states and directs you forward, do not omit nor add anything more that what your book states, for if you do so you will do everything wrong, and you will not profit no matter what you do. And for this reason do not do proceed in any way other than what the book tells you and directs you to do.”

This is in complete accordance with the majority of technical texts concerning book illumination and other decorative arts in the late Middle Ages. Gold was the most glamorous material and it represented wealth and status. Its use in books conferred them “honour and a sense that the text was itself a treasury able to dispense wealth”.

2.1. Mosaic gold (1), (2)

One of the most important pigments referred in the Livro das Cores is a tin sulfide (SnS₂) known as mosaic gold, *aurum musivum, aurum musicum or purpurinus*\(^{66}\). The two recipes included are to be used in book illumination (in chrysography). Chapter 1 describes the combination of ten ounces of “Jupiter” (tin) with five ounces of “fugitive” (quicksilver), five ounces of sulphur and two ounces of sal ammoniac. Chapter 2 suggests as main ingredients “Jupiter”, quicksilver, sal ammoniac and sulphur.

Mosaic gold is the result of the combination of tin, mercury, sulphur and ammonium chloride (sal ammoniac). As J. R. Partington explains, the preparation from mercury and sulphur was already known by Demokritos (c. 460 BC – c. 370 BC), most likely from Chinese sources, and subsequently by Arabic chemists\(^{65}\). Mercury, sulphur and sal ammoniac were considered “spirits” together with arsenic in the old classification of Zosimus (end of the third century). Partington further suggests that the preparation of stannic sulphide may have an Arabic source.

The ingredients and the processes described in the Livro das Cores are in accordance with the traditional procedures for mosaic gold. According to Daniel V. Thompson\(^{62}\), mosaic gold is a common pigment in Europe around the fourteenth century. It “reflect[s] an enthusiasm for a technological development rather than the belief that an inexpensive substitute for gold had been discovered”\(^{61}\). Still, from the fifteenth century onwards mosaic gold can no longer be considered as a novelty.

One of the oldest recipes for mosaic gold is included in the late fourteenth century *De arte illuminandi*\(^{64}\). The recipe reads: *“de purpureo colore... qui vocatur aurum musicum”*. It seems that the designation of “mosaic gold” only became common in the second half of the fifteenth century, as before that it was mostly known as *purpurinus*. Other known recipes for mosaic gold are included in the *manuscript of Jehan Le Begue*\(^{65}\), where similarly to the Livro das

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\(^{60}\) There are other names, such as variations of the word “purpurinus”, or the German word for mosaic gold, *Judengold* (Jews’ Gold).


\(^{64}\) *De Arte Illuminandi* is an original and well-organised manuscript (MS XII E 27, Naples Bib. N.) on book illumination, most likely written in southern Italy in the end of the fourteenth century. No other copies of this text are known. The most well-known edition is: Daniel V. Thompson, *The technique of manuscript illumination. A translation of De Arte illuminandi* (Yale: University Press, 1933).

\(^{65}\) The *manuscripts of Jehan Le Begue* are several texts dealing with art and craft techniques that were compiled by Le Begue. In 1431 he copied them and compiled them in a single volume with a preface and a glossary composed by him. This volume also contains fragments of other known texts (cf. chapter 9 § 4.3).
Cores, weights of tin, mercury, sulphur and sal ammoniac are also specified, although the procedures are different. There is another recipe for mosaic gold in the Il libro dell’arte\textsuperscript{66}, but it is very imprecise.

Regarding its designation in the Livro das Cores, mosaic gold is referred to as “ouro musico”, which is a less common term. The only known parallel is with the Montpellier Ms H490\textsuperscript{67}, where mosaic gold is called “aurum musicum”. The specificity of this designation is not enough to determine the date of the recipes\textsuperscript{68}, but there are other similarities between the two texts, such as the reference to “anoxatar” or Armenian salt instead of sal ammoniac in the Livro das Cores, which is similar to what happens in the Montpellier Ms. H490.

Recently, António João Cruz was able to determine some similarities between the Livro das Cores and the Bolognese Ms\textsuperscript{69} (also known as Segreti per Colori), more specifically, in terms of the heating process and the proportion of the ingredients\textsuperscript{70}. However, the first recipe of the Segreti per Colori is incomplete, as it only mentions mercury and Venetian tin, while the other recipes mention sulphur and sal ammoniac and Roman tin (which are absent from the Livro das Cores).

2.1.2. Gold leaf (3), (36), (38), (39)\textsuperscript{71}

One of the most frequent subjects in medieval treatises is the application of metal foils, especially gold leaf. According to C. Hamel\textsuperscript{72}, it is possible to divide the application of gold leaf in books in two periods: until the thirteenth century, gold leaf was applied flat and directly on the page using gum or glair and burnished after drying; after 1200, gold leaf started to be applied into gesso with bole, which usually formed a higher surface that gave more volume to the golden areas of the pages, which was subsequently burnished. Chapter 3 in the Livro das

\textsuperscript{66} Cennino Cennini’s Il libro dell’Arte is one of the best known medieval texts dealing with book illumination. It was written in the end of the fourteenth century (cf. chapter 9 § 4.6).

\textsuperscript{67} The Montpellier MS H490 is a miscellaneous volume mostly written in Spanish with some Latin additions, most likely by Juan de Celaya between 1460 and 1480 in Salamanca (cf. chapter 9 § 4.7).


\textsuperscript{69} The Bologna Ms. or Segreti per colori is a fifteenth century anonymous compilation. One of the recipes is for the preparation of purpurinus to imitate gold.

\textsuperscript{70} Cruz, António J. “Em busca da origem das cores de “O Livro de Como se Fazem as Cores”: sobre as fontes de um receituário português medieval de materiais e técnicas de pintura,” in The Materials of the Image (Lisbon: Campo da Comunicação, 2010), 75-86.

\textsuperscript{71} Chapter 39 of the Livro das Cores deals with laying both gold and silver leaf.

\textsuperscript{72} de Hamel, The British Library Guide, 12.
Cores gives instructions for the preparation of what we suppose to be a sort of a bole, a mixture of stag’s glue with burnt peach stone and ochre.

Of binders for gold leaf, there is some variety: fish or animal glue (3), a mixture of ochre, white lead and chalk, bind with glair (25), saffron with gum and egg-white (36), parchment glue (38) and (40), and bran glue (43). About procedures, the most common is burnishing the gold leaf with a tooth (pig, wild boar or horse), e.g. (25) and (39). Some chapters provide further instructions, as for instance chapter 36, where several procedures are suggested to prevent any air movement. Moreover, in this chapter, there is a reference to the use of cotton so as to help the gold leaf application.

2.1.3. Other yellows (25), (31), (32), (41)

In addition to mosaic gold, there are other pigments and dyes used to imitate gold as well as writing with gold, such as saffron, orpiment and ochre. These recipes are quite succinct, perhaps due to being common. Saffron (chapter 25) is a dye derived from Crocus sativus L., and it was quite common in both book illumination and painting. Chapter 31 suggests the tempering with glair and, if necessary, orpiment well ground with egg-white.

Orpiment, a sulphide of arsenic is found in nature as a stone, where its colour is a light, vivid yellow, sometimes pure yellow, but more often slightly inclined towards orange. It was also a frequent ingredient in medieval painting and especially for chrysography. It was a difficult pigment, as it is corrosive in its binding media and cannot be mixed with white lead or verdigris. De Arte Illuminandi states that it is not good to use orpiment on parchment.\textsuperscript{373} Orpiment is mentioned as "azarnefe", translated as arsenic (19) and as “jalde”, translated as yellow (41). This last one has been identified as orpiment and a variety of realgar (arsenic)\textsuperscript{374}. It was bought in the shape of a stone and was mostly used in oil painting, as it did not work with tempera. It usually needed a drying agent, that could be minium or alum.

Finally, ochre (most often an earthy pigment) is prepared by mixing vermilion with yellow ("jalde") and, if necessary, a little black, as described in chapter 41.

\textsuperscript{373} Thompson, The Materials and Techniques, 178.

2.1.4. Other uses of gold (4), (16), (19)

There are a few other procedures dealing with gold: the first is gold grinding (4). This is an important part of the text due to the references to specific coins, such as “dobra”, “escudo”, and “florin” and have been used to establish the date of the text of the Livro das Cores as being later than the thirteenth century, most likely from the fourteenth (or perhaps fifteenth) century. In second part of the Livro das Cores there are instructions for the laying gold on swords and knives (16). In this chapter there is a curious reference to “vegera boli” and “azarcoanboli”575. These were most likely boles, in particular, coloured clays here used as etching resist576. Finally, on chapter 19 there is a reference to “fezes de ouro”577, that must be litharge of gold. The recipe further indicates that the litharge of gold is found in arsenic (orpiment).

2.2. Blues

The colour blue, in the Middle Ages, is one of the most important and symbolic colours. In some European countries, the production of blue clothes was subject to control (although this was not the case in Portugal). The most frequent and older blue pigments were azurite, a bright blue hydrated copper carbonate mineral \( \text{Cu}_3(\text{CO}_3)_2(\text{OH})_4 \), and indigo, a natural dye from the Indigosfera family. The most desired blue was ultramarine, a pigment of the highest quality prepared from the semiprecious stone lapis-lazuli. The process of preparation was already established in the thirteenth century, and it was a complicated one. Azurite, on the other hand, was more widespread in the Middle Ages than lapis-lazuli and it was usually coarsely ground. Another common blue was small; however, there is no reference to it in the Livro das Cores.

In the Livro das Cores, the majority of recipes concerning blue deal with its tempering. The exception is chapter 5 where it is described the extraction of blue from silver (silver blue). Also relevant is the fact that there are very few references to azurite578, the predominant blue pigment in the Middle Ages579. The reason for its omission must be the fact that it was already a common and well-known process.

575 Considering that “azarcon” is translated as red lead, it is most likely a red ochre, also known as Armenian bole.
577 There is also reference to litharge of silver.
578 Following the translation of Blondheim, there is a single reference to azure on chapter 27: “If you wish to make a blue color, put azure in it.” Nevertheless, both Moreira de Sã and Strolovich use the word “azul”, which is translated by Strolovich as blue and not azure.
579 Thompson, The Materials and Techniques.
2.2.1. Silver blue (5)

Chapter 5 describes the production of silver blue employing silver and vinegar to obtain a pigment similar to the ultramarine blue (Acre). It is a process of 22 days and implies the total closure of the pot. Also important is the reference to silver as “luna”, which has been identified as an example of the alchemical language employed in the Livro das Cores.

Within the medieval texts on colour preparation, there are several recipes for silver blue in the following texts: Mappae Clavicula\textsuperscript{380}, manuscript of Jehan Le Begue, Strasbourg Ms., Segreti per Colori and the Montpellier Ms. H490. There are some similarities with the Mappae Clavicula, which presents three different recipes\textsuperscript{381}. The second recipe is the closest to the Livro das Cores, as it employs vinegar; yet, it does not make reference to honey. In relation to the other texts, there are some similarities which are not enough to establish a direct connection between the texts. Finally, the Montpellier Ms. H490 also provides a recipe for silver blue, which is related to the recipes of the Segreti per Colori. This is, in our opinion, the closest to the recipe of the Livro das Cores.

2.2.2. Tempering blue (6), (7), (26), (29), (34)

One of the most frequent recipes in the Livro das Cores is for the tempering of blue. They are very common recipes and suggest a variety of binders such as gum arabic, glair, gum water and egg yolk. Chapter 7 makes reference to lye made out of vine branches. The tempering is especially important on chapter 6, as the blue is supposed to be very shiny due to gum arabic. Chapter 26 refers to turnsole (although the passage is omitted) and to brazilwood used to enrich the colour blue, similarly to chapter 34. Chapter 29 suggests some gradients of blue ("sky-blue"), mixed with white lead.

2.2.3. Turnsole (24), (26)

Although chapter 24 is incomplete, it explains the manufacture of turnsole ("catasol") and how to temper it. According to Daniel V. Thompson, turnsole became especially common in the fourteenth century although it was already used in the twelfth century. Mark Clarke

\textsuperscript{380} Perhaps the best known medieval text dealing with pigment and colour preparation for book illumination. It is a compilation of previous existing texts (cf. chapter 9 § 4.1).

\textsuperscript{381} In his study, António João Cruz only took into account the first recipe for silver blue of the Mappae Clavicula. He further suggests that the only similarity is the reference to pure silver. However, we have been unable to find such reference in the recipe for silver blue (5).

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further suggests that the word “catasol” can be a calque from the Latin “torna-ad-solem”, which should not be translated as “sunflower” but rather as “turnsole”, a dye product resulting in red, purple or blue according to the alkalinity. The other mentioned chapters only refer it.

2.2.4. Indigo (24), (27), (35)

Indigo, whose name derives from the word India, is a blue dye extracted from plants such as the Indigofera tinctoria. It usually requires the usage of an alkaline source (frequently urine). There are many recipes for indigo in medieval technical texts, and there are several recipes dealing with it in the Livro das Cores. Being a natural dye, indigo allows a variety of results. On chapter 27 indigo is referred to as “Indian colour” (“coor india”), a reference to the origin of the dye (the same on chapter 35). However, this has little to do with the dye, as the process described implies the mixture of rose with blue. The other two chapters mention indigo (black indigo and light indigo, respectively).

2.2.5. Other blues (35), (37)

Chapters 35 and 37 deal with colour mixtures, in the first case, for shading. Yet, in both chapters, there are no detailed instructions for the preparation of blue.

2.3. Reds

The colour red is one of the most indispensable colours in any artist’s palette, and was a major concern in texts dealing with book illumination. Since early times, a bright scarlet colour, vermilion, was obtained from cinnabar (of which there are no references in the Livro das Cores). From the ninth century onwards in Europe, synthetic vermilion, a compound of mercury and sulphur, was also made. Both types are dense and opaque, with a brilliant hue. This means that because of its opacity vermilion cannot be used for glazing, needing a translucent pigment such as red lake.

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382 In fact, and despite the confusion in English, the word “sunflower” is translated in Portuguese as “girassol”, which is different from “catasol”, a word that still is used for the dye.

383 “Lake is the name given to a range of pigments based on dyestuffs obtained from both plant and animal sources. The most common is perhaps cochineal, a deep purplish-red dye. Lac and kermes are two other insect sources of red dyestuffs, and there are also plant dyes extracted from brazilwood and the madder plant. The overriding characteristic of lakes is their translucency, particularly in oil paint.” David Bomford, A Closer Look - Colour (London: National Gallery, 2009), 41.
2.3.1. Minium (10)

On chapter 10 there is a recipe for the preparation of minium ("azarcon") from the roasting of white lead ("azarcon"). According to Thompson\textsuperscript{384}, this was the medieval way to prepare minium, and it does not necessarily correspond to contemporary minium (red lead), as it was paler and more orange. The recipe on chapter 10 gives instructions to leave the white lead in the glass furnace for 22 days, which is the same amount of time suggested for the preparation of silver blue.

2.3.2. Vermilion (15)

According to Clarke\textsuperscript{385} and Thompson\textsuperscript{386}, the most common recipe in technical texts for colour preparation is synthetic vermilion, by heating together mercury and sulphur (the "parents" of all metals, in alchemic theories). However, by the fourteenth century it was a process already well known and frequently omitted. Naturally, the manufacture of vermilion was a common recipe in alchemic texts, particularly in the context of transmutation. The recipe presented in the \textit{Livro das Cores} is within the normal procedures for the preparation of vermilion, although the reference to a dog’s foot with hair and flesh raises the possibility of some sort of technical superstition\textsuperscript{387}. Still, it could be seen as a better way to mix the ingredients\textsuperscript{388}.

2.3.3. Carmine (13), (14), (18), (30)

The term, that can be also translated as crimson, is usually applied to scale insect lakes. In the \textit{Livro das Cores}, there are several recipes concerning this ingredient: on chapter 13 the ingredients are urine (alkaline source), ashes, quicklime and lac. In this chapter, the word \textit{TRUN} was transliterated as “assado”, and has been translated as “fried meat”. However, we believe that it should be transliterated as “asado” which is the Galician word for a pot with two handles.

\textsuperscript{384} Thompson distinguishes two types of minium: orange lead and cinnabar. There is no reference to cinnabar in the \textit{Livro das Cores}.


\textsuperscript{386} Thompson, \textit{The Materials and Techniques}.

\textsuperscript{387} Harold Abrahams, “A thirteenth century Portuguese work on manuscript illumination.” \textit{Ambix} 26, no.2 (1979): 97-105.

\textsuperscript{388} We would like to thank to Catarina Miguel from the New University of Lisbon for this indication.
The next recipe (chapter 14) lacks the colouring agent, and chapter 30 only mentions the tempering of the pigment with water and egg yolk. From this colour another one (blood colour) was obtained, by mixing blue.

Chapter 18, that deals with the dyeing of bone and wood the colour red, also suggests the use of lac, “as much as you need”.

2.3.4. Rose (8), (9), (27), (44)

In the Livro das Cores there are several recipes for the colour rose, mostly prepared from brazilwood. According to Mark Clarke\(^{389}\), this points to typical practices of the fourteenth century, although by the fifteenth century red inks made from brazilwood became very popular and were highly esteemed by medieval painters\(^{390}\). In books, brazilwood was often used as ink. In the Middle Ages there were several types of brazilwood available. Brazilwood was an important source of red for dyeing (the dyestuff was known as “brazilin”, which oxidises when exposed to air). Its preparation usually involved the scraping of the wood with a piece of glass, and was often soaked in glair and then mordanted with alum.

When describing the procedures of brazil lakes, Thompson distinguishes two types: transparent and opaque lakes. For the first type, the process is made by steeping brazilwood in a solution of lye or in a hot solution of alum extract, or by adding lye to the alum extract (or vice-versa). In this case, the result will depend on the acidity or alkalinity of the mixture, and also on the amount of brazilwood (the more brazilwood, the warmer the colour). For opaque lakes, the process is done by alum precipitated in chalk, and the result is a more opaque rose colour by the mixture of calcium sulphate to the alumina lake.

In the Livro das Cores, there is a similar process on chapter 9, as lye (“decoada de vides”) is used together with alum (“pedra-ume”) and chalk (“pedra-cre”). On chapter 8, the process is similar, despite using urine instead of lye with the addition of white lead (“alvaialde”), which was used to give a little substance to the lake and to make it less transparent and give a stronger gradient of rose. Chapter 27 suggests a similar procedure, and on chapter 44, instead of chalk, quicklime is used. Finally, we should note that the recipes presented resemble those of the manuscript of Jehan Le Begue.


\(^{390}\) Thompson, The Materials and Techniques, 116-121.
2.4. Greens

Green is a common colour in manuscript illumination, as it can be obtained by mixing other colours, or by preparing specific ingredients (mineral and vegetable). The recipes presented in the Livro das Cores deal with the production of the pigment.

2.4.1. Verdigris (11), (12)

The process of verdigris, a common pigment in book illumination, is described in two recipes of the Livro das Cores: on chapter 11 verdigris is obtained by adding vinegar to copper. This process lasted 30 days. This chapter describes a process of adding urine to a brass basin smeared with honey. The use of honey was quite common, probably to keep it slightly moist. The tempering process is with gum-water and saffron. Also in this recipe there is a reference to paper as storage device. As we have already explained in previous chapters, paper was introduced in Portugal in mid-thirteenth century, and it became a common product only in the fifteenth century. Hence, it must be a fifteenth century practice.

2.4.2. Other greens (20), (28), (45)

Chapter 20, which deals with the dyeing of wood and bone objects, suggests a mixture of verdigris with sal ammoniac and strong vinegar, boiled in a copper kettle. The result would be a colour similar to verdigris. The next recipe, chapter 28, deals with the tempering of green, although there is no specification of which pigment. The last chapter in the Livro das Cores instructs on the production of a green colour from lily, in a process similar to the one described on chapter 24.

2.5. Black (dyeing and tempering)

2.5.1. Dyeing black (17), (19), (21)

Chapter 17 describes the dyeing by boiling the objects of bone and wood with olive oil three times and add to it sulphur, whereas chapter 19 suggests a more common process: mixing iron fillings and copper fillings with plain salt and litharge of silver and of gold. To this

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399 Thompson, The Materials and Techniques, 168.
398 Cruz and Afonso, "On the Date and Contents...", 18.
is added strong vinegar and vitriol. Vitriol is one of the most classic substances used to obtain black in the Middle Ages, and was also used for the production of paint. Finally, chapter 21 suggests a third process: the addition to bone fillings of vinegar, cuprous oxide, garlic and red vinegar. This chapter is incomplete.

2.5.2. Tempering black (33)

The process of tempering black indigo involves gum-water and egg-yolk, and the addition of white, if necessary.

2.6. Binders

In terms of binders, there is a clear predominance of gum water and glair, used separately or together. We should note that the combination of glair with gum water is one of the indications that the Livro das Cores is a fifteenth century text93, as only in this century the combination of both techniques became ordinary. Besides these two techniques, there are references to egg yolk, and glue is also used, mostly with metal leaves. Finally, there is an interesting reference to linseed oil in chapter 42, although in the context of varnish.

2.6.1. Gum with glair

According to Thompson, the pigments tempered with gum water and gum arabic are known as water colours, as the use of gum produces a more transparent and shiny effect than glair. From the fourteenth century onwards, there is a general tendency to replace glair with gum, especially with blue pigments. One should note that gum water was not necessarily made with gum arabic, as there are several other possible gums, although they are not usually so easy to work with.

Throughout the Livro das Cores, there are several references to gum water and, to a much lesser extent, to gum arabic. In fact, there are only two specific to gum arabic, chapters 2 and 6, but this last one is especially relevant, as there is a clear reference to the fact that the use of gum arabic produces a shiny blue pigment. Moreover, it is possible to establish two different ways to bind blue pigments in the Livro das Cores: dark blues are bound with gum, whereas

93 Thompson, explaining the differences between the use of glair and gums, states that glair usually needed to be “varnished”, and from the fourteenth century onwards this was done with honey or sugar, in order to increase depth and richness, and “In the fifteenth century, gum benzoin came to be used for “varnishes” of this sort in books; and occasionally mixtures of gum arabic.” The Materials and Techniques, 56.
light blues are bound with glair (and they are prepared with white lead). Nevertheless, the majority of recipes employ both gum water and glair together.

2.6.2. Glues (3), (4), (38), (40), (43)

In addition to the instructions to laying gold leaf on books, the final part of the third chapter of the Livro das Cores also provides instructions to prepare fish glue as a binder to gold. This was done by boiling fish skin, congee-eel ("congrio") to which was added a size of ochre and a peach stone.

Chapter 40 deals with the preparation of parchment glue, and it describes the use of parchment glue as a binder to gold, together with chalk mixed with saffron.

2.6.3. Varnish (42)

There is a single recipe for the manufacture of varnish on chapter 42. It suggests the use of "garassa de cobra", or "nobra", which is an ingredient not yet identified. According to Thompson this should be read as "grassa d'eneblo". Thompson further explains that the word "glassa" originally meant amber. Also, there is a reference to linseed oil, which again reinforces the later date of the Livro de Como se Fazem as Cores das Tintas.

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Conclusions
CONCLUSIONS AND FUTURE WORK

Hebrew manuscripts are one of the preferential means of artistic and cultural expression. In Portugal, particularly in the second half of the fifteenth century, there was an intensive production that remains to be fully assessed. In addition to contradictory studies on this matter, Portuguese Hebrew manuscripts are frequently seen as a mere continuation of other Iberian schools. The Ms. Parma 1959 is one of the manuscripts copied in this period. Still, it cannot be compared to the sumptuous Bibles nor to the careful copied siddurim. Yet, it is surprisingly interesting, as it works as the underlying structure of all Hebrew texts, not only codices but also Torah scrolls, mezuzot, tefillin, and meglilot.

Clearly, the inclusion of the Livro das Cores is one of its most important features, as this is the only Portuguese source for the preparation of pigments and paints. The choice for the transliteration of what must have been a previously existing source can be interpreted as a sign of acculturation or, perhaps, the cultural dynamics between the Jewish minority and the rest of the Portuguese population.

1. Main conclusions

This dissertation focused on a specific overarching research question: Can the Ms. Parma 1959 be viewed in the context of Hebrew book illumination in Portugal? In order to address it, we proposed to answer three main questions, that naturally unfolded into several other secondary questions. We believe to have successfully answered the primary research question through these questions. The Ms. Parma 1959 is associated to the production of the so-called “Lisbon school” in an indirect way, as its most probable date of copy is 1462 and the oldest manuscripts illuminated in Portugal date from 1469. Still, and considering the themes it includes and its context, we must consider a possible relation.

1.1. The context of the Ms. Parma 1959

The first question concerned the historical circumstances surrounding the production of Hebrew texts and the Ms. Parma 1959 (cf. chapter 1 § 3.1). We believe that the conjunction of
two primary factors enabled the necessary structure for the production (copy, illumination, binding, etc.) of Hebrew manuscripts in Portugal:

(1) A long-established Jewish community in Portugal with an active role in the economic and social dynamics, and whose contribution to the general cultural production in the country is far from being assessed. Within the structure of the Jewish communities there was the necessary expertise and audience for Hebrew manuscripts;

(2) The influx of Spanish Jews into the country particularly in the second half of the fifteenth century. The social and economic structure of the Jewish communities changed and Portugal eventually became the last stronghold of Sephardic Judaism and Sephardic culture in the Iberian Peninsula. Clearly, the growth of the communities also implied a larger and perhaps new “audience” for books and other forms of cultural production.

Hebrew manuscripts copied in Portugal are inscribed in a long tradition of Sephardic illumination. They can be considered as final expressions of an artistic, historical and cultural era. All Sephardic manuscripts decorated from the sixteenth century onwards reflect new circumstances and new influences that no longer are directly associated with the Iberian Peninsula.

In what concerns the Portuguese manuscripts, it is possible to conclude that they are deeply influenced by previous Hebrew manuscripts and iconographic traditions, even though they convey a particular style. Frequently, fifteenth century illumination is viewed as a moment of decline in the history of Sephardic illumination and a reflection of the historical circumstances of the Iberian communities. However, we believe that Hebrew-Portuguese manuscripts reflect elevation and cultural assimilation rather than decline. Notwithstanding the frequent misconception that they are aesthetically inferior to other Iberian groups, Portuguese manuscripts symbolise their own historical circumstances and they reflect the local artistic tastes, both in Jewish and in Christian circles.

1.2. The audience of the Ms. Parma 1959

Regarding the second research question (cf. chapter 1 § 3.2), it is striking the lack of studies on the Ms. Parma 1959. Apart from catalogue descriptions by Giovanni de Rossi and Benjamin Richler and Malachi Beit-Arié, all references address it in the context of the Livro das Cores. Along with the lack of studies, there is no unanimity regarding its contents. The Ms. Parma 1959 is viewed as either (i) a random collection of texts dealing with the copy of
Hebrew manuscripts; or (ii) a homogenous collection of texts that can be associated with the copy of manuscripts in Lisbon in the second half of the fifteenth century.

It is our belief to have solved this question, although the answer is a complex one. First, we have concluded that there are three predominant themes in the Ms. Parma 1959: (i) texts dealing with para-textual aspects of the copy of Hebrew sacred texts; (ii) texts concerning several aspects of Jewish liturgy; and (iii) halakhah, that is traditions and rules regarding the copy of Hebrew sacred texts.

In addition, the volume is palaeographically homogenous. In fact, the palaeographical study of the texts included in the Ms. Parma 1959 confirmed our philological analysis: texts dealing with para-textual elements are essentially written in semi-cursive script, with three exceptions that are easily explained: (i) the tefillin texts, written in square script due to the nature of the text; (ii) the recipes, written in cursive script, and that can be considered as textual additions; and (iii) the masorah notes that are written in several modes, most likely due to the fact that they are annotations. Semi-cursive mode is equally chose for the writing of the second group of texts (liturgical texts), whereas the third (halakhah) is exclusively written in current semi-cursive. We thus conclude that it is reasonable to relate the nature of the text to the choice of script.

The second part of the initial question is related to the concept of compilation. In our codicological study, we observed that the Ms. Parma 1959 could be divided in two main parts: before and after Asher b. Jehiel’s text Asheri. Our conclusions are based in the type of watermarks included in the volume: in the first half, the only watermark to be found is the crown (dating from 1423 to 1488). Equally, in the second part of the manuscript there is a single watermark: the scissors (dating from 1448 to 1463). Hence, all the other watermarks are included in the Asheri text.

We believe that several elements point to the combination of two methods in the assembly of the Ms. Parma 1959. It is undeniable the whole manuscript shares similarities in terms of page layout (margins, justification, number of lines) and, to some extent, in terms of script, despite the modes of writing. Still, watermarks and type of texts, as well as a slight difference in the number of lines may point to an initial process of compilation (foll. 1—77) followed by the subsequent writing of the next texts (foll. 80—211), with some additions (poem and recipes). It is equally possible that the last two texts may have been added subsequently, following another textual addition (the rhymes). Another evidence that supports our argument is the additional numeration of three main texts of the first part of the Ms. Parma: the Livro das Cores, Calendar and Asheri together with the two other numeration systems.
Yet, all of this must have been done by the same person within a short time. Another argument to this is the inclusion of the signature at the end of the Livro das Cores. It could initially be a single text and subsequently other texts dealing with the same subject were added to it.

Finally, it should be underlined that the List of oddly shaped letters must be an original text, as suggested by the prologue: “I, Abraham b. Yehuda ibn Hayyim, wanted to write the crowned(?) letters in taggin and swirls and curved letters that I have [personally] found in an accurate Torah scroll.” Undoubtedly, this points to Abraham ibn Hayyim being the writer of the entire volume.

So far, we have concluded that the Ms. Parma 1959 is a homogenous compilation of texts dealing with the copy and other para-textual aspects of Hebrew sacred texts. It is now left to examine whether it can be associated with Portugal and, more specifically, with the production of illuminated Hebrew manuscripts in the second half of the fifteenth century.

Considering the matters dealt in the manuscript, we believe that there is some possibility of a direct connection of the Ms. Parma 1959 to the production of illuminated books and to the copy of Hebrew Bibles and siddurim. The first indication in the inclusion of the Livro das Cores and additional recipes with a common theme, that of the decoration of books. Another indication are the notes on the masorah. The masorah by the end of the Middle Ages was essentially used as ornament. In fact, massoretic elements are a key decorative feature of the Portuguese Bibles. A third indication of a direct connection is the inclusion of pizmonim and baqashot, as at least some of them were surely included in siddurim.

To these evidences we would like to add the existence of some iconographic elements that may point to (at least) some degree of connection with the Lisbon manuscripts: the type of marginal drawings and text frames, as well as the type of ink used in the frames; the sketch on fol. 36r, that may be related to the binding that is typically Portuguese. However, we are aware of the fallacy of some of these arguments and we believe that only a deep study on the Portuguese manuscripts, both in terms of illumination materials and techniques and of contents, will allow us to fully address this question.

Besides the contents of the Ms. Parma 1959 itself, two other questions are normally associated with it, most frequently in relation to the Livro das Cores: (i) its date of copy; and (ii) its compiler or copyist.

Regarding the date of the Ms. Parma 1959, watermarks suggest that it was copied between 1423 and 1463. In fact, this raises the possibility of the colophon on the List of oddly
shaped letters correspond to the year 1462, a date further confirmed by several watermarks such as the bull’s head and the ring date from 1462. Clearly, this eliminates the possibility we had initially raised (cf. chapter 1), of the List being a copy of a previous text and the colophon copied verbatim. That is, and in relation to the second question, considering the watermarks and the colophon, it is reasonable to conclude that Abraham ibn Hayyim wrote at least the List of oddly shaped letters in the fifteenth century, most likely in 1462, a conclusion that agrees with the large majority of research in the matter.

So far, we believe to have established that ibn Hayyim is the author of the List of oddly shaped letters and, due to the date on the colophon and the watermarks, this text was most likely copied in 1462. We have also established that this is a well-organised compilation of texts dealing with the same subjects. Hence, we have reason to believe that the signature in the Livro das Cores is ibn Hayyim’s, although we do not believe he is the author of the text. The signature follows the common style of fifteenth-century Sephardic signatures, and there is no proof that the ink here used is different from the rest of the text (although the same does not apply to the marginal note on fol. 1r).

One reasonable possibility is the ibn Hayyim copied the first text and signed it as his own copy and, subsequently added other texts, including one written by himself and others copied from known sources (which would explain the compilation and subsequent writing process). This possibility would account for the fact that there are no significant differences in the palaeography of the volume. Most differences are due to the mode of writing and to textual additions.

Finally, and in relation to the association of Abraham ibn Hayyim and Joseph ibn Hayyim, we do not yet possess the necessary elements to answer it. However, and given the 1462-1476 timeframe, as well as the similar binding, we have reason to believe that such association should be further evaluated.

1.3. The Livro das Cores

Regarding the third and last research question (cf. chapter 1 § 3.3), we evaluated the most relevant features of the Livro das Cores, such as the originality of the text. Notwithstanding the Livro das Cores being the sole Portuguese medieval representative of texts dealing with the preparation of pigments and paints, it shares a structural similarity with other compilations of recipes, and it is clearly in accordance with fifteenth century (and fourteenth century) illumination practices.
Second, the *Livro das Cores* is written in Portuguese with Hebrew script, which is a rare example of such combination and raises several questions by itself. We believe that the original version, or source (or sources) is now lost. The lack of Jewish elements in the text, and especially in a type of text that could easily include a more secretive language, must be interpreted as an indication that the original is not “Jewish”.

That is, this particular feature must be viewed as symptomatic of the environment of Hebrew illumination in Portugal. We believe that the *Livro das Cores* is not originally written by Abraham ibn Hayyim. Yet, and similarly to other examples such as the *Thesaurus Pauperum*, the partnership between Portuguese language and Hebrew script may serve as evidence of the cultural assimilation of its copyist. The choice for the Hebrew graphical representation must be interpreted not as a sign of an intention for secrecy, or to avoid others not familiar with the Hebrew writing system to access the text. It should be viewed instead as a sign of acculturation. Also, it is in accordance with several other technical texts (from the same period) that are written in a similar fashion.

This last conclusion raises another important question that we are not yet ready to answer: to what extent can we assume that such assimilation is “passive”, in the sense that it only works from the copyist’s perspective? Why not consider a mutual influence, similarly to what happened in many other places, both in European and in Muslim context? For now, we do not have enough elements to consider this, but we believe that this is a reasonable possibility given the social structure of the Jewish community in Portugal.

Regarding the more practical relationship of the *Livro das Cores* with Hebrew illumination, we have opted to revise the previous studies and enlist the main features of the text, considering our future work with the Portuguese Hebrew manuscripts. The *Livro das Cores* is a clear and practical manual for the preparation of colours, where procedures described are feasible and may well have been used in Hebrew illumination. Two elements are good indicators of such: the amount of recipes for the imitation of gold (and chrysography) and the application of metal foils as well as the variety of colours.

2. Future work

Throughout our dissertation, we believe to have raised several questions that must be answered in the future. Some of them are directly related with the Ms. Parma 1959 and the *Livro das Cores*. Others are more general and concern the corpus of Portuguese Hebrew manuscripts.
Regarding the Ms. Parma 1959, we believe that the several texts comprised in the volume should be further evaluated, particularly the *pizmonim* and the *baqashot*. Such study will clearly enrich our knowledge on the liturgy of the Portuguese community prior to the sixteenth century. In addition, the *List of oddly shaped letters* should also be considered, especially due to the scarcity of sources on the medieval “anomalous” letters in Torah scrolls.

One of the most striking conclusions is the lack of research on the Jewish cultural production, which also remains to be contextualised in terms of the Portuguese cultural heritage. The scarcity of Hebrew works is clearly attributed to the historical circumstances of the Portuguese Jewish community. However, we believe that this is a pertinent field of research, and an initial effort must involve the study of the previously known records and new searches in Portuguese libraries.

A second line of research must deal with the relationship of the *Livro das Cores* and Hebrew illumination. We believe that an analysis on the type of pigments used may easily resolve this question. However, it must be taken into account the fact that almost all Portuguese Hebrew manuscripts are outside of Portugal, which is a serious obstacle to future studies. It cannot be a coincidence that the majority of dated Hebrew manuscripts are associated with a specific period. It is thus necessary to evaluate the manuscripts with decoration and establish whether they are the result of an organised structure or rather the work of independent artists whose work reflects the predominant taste.

In the case that these manuscripts resulting from a communal effort, it must be factually determined whether or not there was a specific location for the copy and decoration of these manuscripts. Two (weak) arguments seems to point to the existence of a “Lisbon school”: the presence of a strong religious community in Lisbon and, consequently, several schools where the manuscripts could have been prepared; and specific type of binding that implies some degree of connection between some of the manuscripts. Yet, structural and iconographic similarities may suggest the use of common stencils and a common preparation of manuscripts.

With respect to the decorative programmes of the Portuguese manuscripts, two angles must be assessed: (i) what is the impact of the Spanish decorative programmes, especially those from Castile, in the Portuguese style; and (ii) to what extent are the Portuguese Hebrew manuscripts influenced by their Christian (Latin and vernacular) counterparts, and to what extent there was a mutual influence or cooperation between the Jewish minority and the rest of the Portuguese population. Even though there is a substantial number of studies of the social and economic relations between Jews and the rest of the Portuguese society, there barely are no studies on the intercultural relationships between them.

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Bibliography
BIBLIOGRAPHY

Abrahams, Harold J. “A thirteenth century Portuguese work on manuscript illumination ("Libro de como se facem as cores"),” Ambix 26, no.2 (1979): 97-105.


Beit-Arié, Malachi. Unveiled Faces of Medieval Hebrew Books. The evolution of Manuscript


ICEP. “Les Juifs au Portugal.” Lisbon, Portugal: Instituto do Comércio Externo de Portugal


Original treatises, dating from the XIth to the XVIIIth centuries, on the arts of painting, vols. I and II. London: John Murray, 1849.


_____.*The Lisbon Bible, 1482.* Tel Aviv: Nahar Miskal with the British Library, 1988.


Tavares, Maria José F. *As Judiarias de Portugal*. Lisbon: CTT, 2010.


Appendices
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Table A.1. Book division in the Hebrew Bible
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<td>Nacim ben Yosef Vivas</td>
<td>71</td>
<td>parchment and paper</td>
</tr>
<tr>
<td>49</td>
<td>1489</td>
<td>Florence, Bibl. Laurenziana</td>
<td>Plut. 88.27</td>
<td>Sciences, philosophy and kabbalah</td>
<td>Lisbon</td>
<td>Nacim ben Yosef Vivas</td>
<td>himself</td>
<td>3</td>
<td>parchment and paper</td>
</tr>
<tr>
<td>51</td>
<td>1491-94</td>
<td>Zurich, Braginsky (Priv. Coll.)</td>
<td>243</td>
<td>Bible - text</td>
<td>Ocana (Spain) Evora (PT)</td>
<td>Yitzhak ben Yishay ben Sasson</td>
<td>O: Abraham ben Yaakov ben Tsadok</td>
<td>o</td>
<td>parchment</td>
</tr>
<tr>
<td>52</td>
<td>1494</td>
<td>Aberdeen UL</td>
<td>23</td>
<td>Bible - text</td>
<td>Lisbon</td>
<td>Moshe ben Yitzhak</td>
<td>Isaac Sarfati (?)</td>
<td>o</td>
<td>parchment</td>
</tr>
<tr>
<td>53</td>
<td>1495</td>
<td>Vatican, BAV</td>
<td>Cod. Vat. Ebr. 473</td>
<td>Bible - text</td>
<td>Lisbon</td>
<td>Moshe ben Yitzhak</td>
<td>O: Abraham ben Yaakov Aßviæia</td>
<td>o</td>
<td>parchment</td>
</tr>
<tr>
<td>54</td>
<td>1496</td>
<td>Florence, Bibl. Laurenziana</td>
<td>Gaddi 158</td>
<td>Sciences</td>
<td>Porto</td>
<td>Yosef ben Avraham Clomiti</td>
<td>R: himself</td>
<td>242</td>
<td>paper</td>
</tr>
<tr>
<td>55</td>
<td>1496</td>
<td>Russia, Moscow RSL</td>
<td>Guenzburg 662</td>
<td>Bible - text</td>
<td>Lisbon (?</td>
<td>Samuel b. Samuel ibn Musa</td>
<td>O: Avraham ibn Dicomin/Ricomin (?)</td>
<td>o</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>1496</td>
<td>Rome, Comun. Israelit.</td>
<td>18</td>
<td>Bible - text</td>
<td>Lisbon</td>
<td>O: Abraham ben Eyahu Roman</td>
<td>o</td>
<td>parchment</td>
<td></td>
</tr>
<tr>
<td>57*</td>
<td>1496</td>
<td>New York, JTS</td>
<td>Micr. 8241</td>
<td>Sciences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>58*</td>
<td>1496</td>
<td>Jerusalem, Schocken Inst.</td>
<td>Ms. 24350</td>
<td>Bible - text</td>
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Table B.1. List of known Portuguese manuscripts

*: unconfirmed
### B2. Scribes of Portuguese Hebrew manuscripts

<table>
<thead>
<tr>
<th>Scribes</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Samuel Adrotil</td>
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<tr>
<td>Natan ben Avraham Alatasifi</td>
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</tr>
<tr>
<td>Samuel Alfaroni</td>
<td>1</td>
</tr>
<tr>
<td>Samuel ben Avraham Altiress</td>
<td>1</td>
</tr>
<tr>
<td>Samuel ben Yom Tov Alzaig</td>
<td>2</td>
</tr>
<tr>
<td>Salomon (Shlomo) ibn Alzuq</td>
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</tr>
<tr>
<td>Yitzhak ben David Balanssi</td>
<td>1</td>
</tr>
<tr>
<td>Menashe(?) / Moshe ben Benyamin(?) Hadar Beshaliniyas</td>
<td>1</td>
</tr>
<tr>
<td>Yosef Catilán</td>
<td>1</td>
</tr>
<tr>
<td>Yosef ben Avraham Clomiti</td>
<td>1</td>
</tr>
<tr>
<td>Yosef ben Yizhak ben Yosef Delouiah/Dalviah</td>
<td>1</td>
</tr>
<tr>
<td>Yosef ben Gedaliah Franco</td>
<td>2</td>
</tr>
<tr>
<td>Abraham b. Yehuda ibn Hayyim</td>
<td>1</td>
</tr>
<tr>
<td>Eléazar b. Moshe Gagosh</td>
<td>2</td>
</tr>
<tr>
<td>Yosef ben Moshe Hayyun</td>
<td>1</td>
</tr>
<tr>
<td>Sasson b. Joseph ibn Job</td>
<td>1</td>
</tr>
<tr>
<td>Samuel de Medina</td>
<td>3</td>
</tr>
<tr>
<td>Sar Shalom ben Moshe Shalom Melion</td>
<td>1</td>
</tr>
<tr>
<td>Samuel b. Samuel ibn Musa</td>
<td>5</td>
</tr>
<tr>
<td>Yosef b. Sasson Sarfati</td>
<td>1</td>
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<tr>
<td>Yitzhak ben Yishay ben Sasson</td>
<td>1</td>
</tr>
<tr>
<td>Ezra ben Shlomo</td>
<td>1</td>
</tr>
<tr>
<td>Nacim ben Yosef Vivas</td>
<td>1</td>
</tr>
<tr>
<td>Moshe ben Yitzhak</td>
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<tr>
<td>Yitzhak bar Yosef Zarco</td>
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</table>

Table B.2. List of known copyists and/or illuminators of Portuguese Hebrew manuscripts
# APPENDIX C  DESCRIPTIONS OF THE MS. PARMA 1959

## C1. Philological description of the Ms. Parma 1959 by Debora Matos (2011)

<table>
<thead>
<tr>
<th>Folia</th>
<th>Title</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O Livro de Como se Fazem as Cores das Tintas</td>
<td>Portuguese</td>
</tr>
<tr>
<td>2</td>
<td>Calendar of regular and leap years with lists of Torah readings</td>
<td>Hebrew</td>
</tr>
<tr>
<td>3</td>
<td>Recipe for stag’s glue</td>
<td>Portuguese</td>
</tr>
<tr>
<td>4</td>
<td>Recipe for size</td>
<td>Portuguese</td>
</tr>
<tr>
<td>5</td>
<td>Scriptural passages for tefillin</td>
<td>Hebrew</td>
</tr>
<tr>
<td>6</td>
<td>Notes on the Masorah</td>
<td>Hebrew</td>
</tr>
<tr>
<td>7</td>
<td>Commentary on Ecclesiastes (9:14 – 10:2)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>8</td>
<td>Midrashic extract</td>
<td>Hebrew</td>
</tr>
<tr>
<td>9</td>
<td>Asher b. Jehiel’s Asher (laws of ST”M)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>10</td>
<td>Poem “Yesod ha-sod ve-sod ha-yasod”</td>
<td>Hebrew</td>
</tr>
<tr>
<td>11</td>
<td>Recipe for a “beautiful colour”</td>
<td>Portuguese</td>
</tr>
<tr>
<td>12</td>
<td>Recipe for mordant (?)</td>
<td>Portuguese</td>
</tr>
<tr>
<td>13</td>
<td>Abraham b. Nathan Yarkhi’s Sefer ha-Manhig (selections)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>14</td>
<td>Mishne Torah (extract)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>15</td>
<td>Legend about the Septuagint</td>
<td>Hebrew</td>
</tr>
<tr>
<td>16</td>
<td>Mishne Torah (Sefer Mada, etc.)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>17</td>
<td>List of the oddly shaped letters found in an accurate Torah scroll by Abraham b. Judah ibn Hayyim</td>
<td>Hebrew</td>
</tr>
<tr>
<td>18</td>
<td>Rhymes about grammar rules (“Kol Leshon Akhilah”)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>19</td>
<td>Liturgical poems (baqashot and pizmonim)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>20</td>
<td>David Kimhi’s Sefer ha-Mikhhol (extract)</td>
<td>Hebrew</td>
</tr>
</tbody>
</table>

Table C.1. Description of the Ms. Parma 1959 (Matos)
C2. Description of the Ms. Parma 1959 by Luís Urbano Afonso (2010)\(^\text{195}\)

<table>
<thead>
<tr>
<th>Folia</th>
<th>Subject</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1r-20r</td>
<td>O Livro de Como se Fazem as Cores</td>
</tr>
<tr>
<td>2</td>
<td>20v-28r</td>
<td>Calendar and lists of Torah readings</td>
</tr>
<tr>
<td>3</td>
<td>28v</td>
<td>Medical recipes</td>
</tr>
<tr>
<td>4</td>
<td>29r-30v</td>
<td>Scriptural passages in tefillin</td>
</tr>
<tr>
<td>5</td>
<td>31r</td>
<td>Notes on the masorah</td>
</tr>
<tr>
<td>6</td>
<td>31v-34r</td>
<td>Commentary on Ecclesiastes</td>
</tr>
<tr>
<td>7</td>
<td>34v-35r</td>
<td>Midrashic extract</td>
</tr>
<tr>
<td>8</td>
<td>37r-77v</td>
<td>Asher b. Jehiel’s Asher (14th century)</td>
</tr>
<tr>
<td>9</td>
<td>78r-79r</td>
<td>Not identified</td>
</tr>
<tr>
<td>10</td>
<td>80r-138v</td>
<td>Extracts from Sefer HaManhig (dated c. 1294)</td>
</tr>
<tr>
<td>11</td>
<td>139r-140v</td>
<td>Extracts from Mishneh Torah</td>
</tr>
<tr>
<td>12</td>
<td>141r-142r</td>
<td>Legend about the preparation of the Septuagint</td>
</tr>
<tr>
<td>13</td>
<td>142r-184r</td>
<td>Mishneh Torah</td>
</tr>
<tr>
<td>14</td>
<td>184r-195v</td>
<td>Masorah by Abraham ibn Hayyim from Loulé (Jewish year 5[..]22)</td>
</tr>
<tr>
<td>15</td>
<td>196r</td>
<td>Rhymes (?) about rules of grammar</td>
</tr>
<tr>
<td>16</td>
<td>197r-210r</td>
<td>Liturgical poems</td>
</tr>
<tr>
<td>17</td>
<td>210v-211v</td>
<td>Extract from grammatical treatise by D. Kimhi</td>
</tr>
</tbody>
</table>

Table C.2. Description of the Ms. Parma 1959 (Afonso)

<table>
<thead>
<tr>
<th>Folia</th>
<th>Title</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1r-20r</td>
<td>Treatise on preparing inks and colours for illumination books, by [?] Abraham b. Judah ibn Hayyim.</td>
<td>Portuguese</td>
</tr>
<tr>
<td>2 20v-28r</td>
<td>Calendar of regular and leap years. With lists of Torah readings</td>
<td>Hebrew</td>
</tr>
<tr>
<td>3 28v</td>
<td>Medical and other recipes</td>
<td>Spanish</td>
</tr>
<tr>
<td>4 29r-30v</td>
<td>Scriptural passages written in tefillin. Two copies</td>
<td>Hebrew</td>
</tr>
<tr>
<td>5 31r</td>
<td>Notes on masorah</td>
<td>Hebrew</td>
</tr>
<tr>
<td>6 31v-34r</td>
<td>Commentary on Ecclesiastes (ix:14 – x:2)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>7 34r-35r</td>
<td>Midrashic extract. This extract is not found in the Mekhila as the title implies, but is found in Pesikta de-Rav Kahana (§ix) and in Genesis Rabbah, Leviticus Rabbah and Tanhuma. Incomplete.</td>
<td>Hebrew</td>
</tr>
<tr>
<td>8 37r-77v</td>
<td>Asher b. Jehiel’s Asheri (laws of ST^M). The scribe copied only till laws of tefillin § xii.</td>
<td>Hebrew</td>
</tr>
<tr>
<td>9 80r-138v</td>
<td>Selections from Sefer ha-Manhig by Abraham b. Nathan ha-Yarchi.</td>
<td>Hebrew</td>
</tr>
<tr>
<td>10 139r-140v</td>
<td>Extract from Mishneh Torah by Moses b. Maimon</td>
<td>Hebrew</td>
</tr>
<tr>
<td>11 141r-142r</td>
<td>Legend about the preparation of the Septuagint</td>
<td>Hebrew</td>
</tr>
<tr>
<td>12 142r-184r</td>
<td>Mishne Torah (Sefer Madda, etc.)</td>
<td>Hebrew</td>
</tr>
<tr>
<td>13 184r-195v</td>
<td>List of the oddly shaped letters found in an accurate Torah scroll by Abraham b. Judah ibn Hayyim</td>
<td>Hebrew</td>
</tr>
<tr>
<td>14 197r-210r</td>
<td>Liturgical poems (baqashot and pizmonim)</td>
<td>Hebrew and Spanish</td>
</tr>
<tr>
<td>15 210r-211v</td>
<td>David Kimhi’s Sefer ha-Mikhlol (extract). End missing</td>
<td>Hebrew</td>
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</table>

Table C.3. Description of the Ms. Parma 1959 (Richler and Beit-Arié)

---


<table>
<thead>
<tr>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 R. ABR. FIL. JEH. ABEN CHAIIM Liber de modo conficiendorum colorum ad miniandos libros hispanice.</td>
</tr>
<tr>
<td>2 ANONYMI Liber ahibbûr seu intercalationis cum nonnullis excerptis.</td>
</tr>
<tr>
<td>3 ANON. Ilooth, seu Constit. libri legis, et mesusà.</td>
</tr>
<tr>
<td>4 R. ABR. ABEN JARCHI Constitutiones tefilin et meghillà ex ej. libro Manhigh.</td>
</tr>
<tr>
<td>5 Ejusdem Constitutiones de repudio.</td>
</tr>
<tr>
<td>6 Constitutiones sehudà seu convivii ex codico libro Manhigh.</td>
</tr>
<tr>
<td>7 R. Mosis MAIMONIDIS Caput vi libri Madah.</td>
</tr>
<tr>
<td>8 Ej. Constitutiones legis, tefilin, et mesusà.</td>
</tr>
<tr>
<td>9 R. ABR. FIL. JEH. ABEN CHAIIM. Liber masoreticus De litteris coronulis ornatis in sacro Pentat. volumine, ac litteris pe convolutis.</td>
</tr>
<tr>
<td>10 Bakascoatth et Pizmonim, seu metricae preces.</td>
</tr>
<tr>
<td>11 DAVID KIMCHI Excerptum ex ejus Michlol de nomine.</td>
</tr>
</tbody>
</table>

Table C.4. Description of the Ms. Parma 1959 (de Rossi)

chart. rabb. 12.a.1262.

Singularis, ineditus, ignotus est primus ille liber, qui et rationem continet auri praeparandi pro miniaturis, ut praefixus indicat titulos: \( \Rightarrow \) Hic incipit liber de modo conficiendorum colorum omnium ad pingendos auroque etiam miniandos libros. Constitat is capitulis 45, involutaque quadem ac lectu difficili subscriptione explicit, quae nomem exhibet Abrahami fil. Jehuade aben Chaaim, qui nescio an libri tantum descriptor sit, vel etiam auetor. Quae sequuntur constitutiones anonymae videntur et ipsae desumptae ex celebri rituum compendio Manhigh, ut notatae sub n° 4.\( ^{a} \) et 6.\( ^{a} \). De nono opusculo ejusque auctore altum apud Wolffium silentium. Is sub initium libri testatur se litteras illas describere, prout eas in accurstissimo ac singulari Pent. vol. repererat, ad calcem vero se \( \Rightarrow \) eas absolvisse in urbe luli (HEB) die v mensis sivan an. 22 sexti millenarii a creatione mundi <<, Chr. 1262. Quam epigraphem non tam de libri compositione, quam descriptione intellecit recentior judaeus in nota ad marg. I folii.
APPENDIX D

TRANSLITERATION OF THE PORTUGUESE RECIPES IN THE MS. PARMA 1959

Dr1. Recipe for stag’s horn glue

![Image of recipe page]

**Figure D.1 Recipe for stag’s horn glue (fol. 28v)**

**Transliteration**

רמא מזורי בזרא אינטגראר דיקורונקרדי סירב קרומאת בזראוי ג’יניילו נfavicon א’קואמאא וא די
4 קיו
אשתטברור קרימאא מקפל פידאמדהא או ג’יינאאאא 4 אדרמטליי קרואאא או קואמאאא 5 קיו
יאטנגראאא עלים פאלאיו או ג’יינאאאא 6 דר תורס פאראאה לאו דאש או ידאפיוש קואלאאהנ קון
7 אוזאא תשלד די פידאמאה ראהל או ק.google א’דרמאנד או ג’יינאאאא 8 ג’יינאאא אדו פאראא או קואמאאא אדו ידאפיוש 9
10 פאסטל טאיליאידאא או פאשווא או אי ק’טינאאא.

**Translation**

To make good glue from stag’s horn take the horn of the stag and put it in the fire and burn it and when it is burned make it into pieces and put it in water one day and one night and boil it with the water where it was and subtract from the three parts two and filter it with a loose cloth in a pot and leave it in the night in the cold and filter it and make it taleidas (?) and put it to dry.
D2. Recipe for size

![Image](http://example.com/image.jpg)

**Figure D.2. Recipe for size (fol. 28v)**

**Transliteration**

פירה קבסא לייטראש

אין פירוד...

טומארארש וא ארונן שוליותא) שלובאל) וא מאולאש

אין טומארארש וא ראשונא ברקך וא דיטאלאש

שוברי וא לייטראש קך ושטאירא שוניאלדהש

קואשישב בול וא בודגר זא קוך סידא וא דין

פאות יש גנטאלאש וא/ו הרא/ביכ יא אוש

פואוש ניא סימה

Pera cavar letras | de ferro | tomaras o argen soluvel e moeloas | de e tomaras o vinagre branco e deitaloas | sobre as letras ke estao sinaladas | de coasisa boli (? e bordeg’ada (?) con sera e de | pois ‘geitalo otra vez e os poos en cima.

**Translation**

To puncture letters in iron take soluble (liquid) silver (mercury) and grind it(?) and take white vinegar and pour it over the signaled letters with the size bole (?) and surrounded with wax and afterwards adjust it again and the (put) powder over it.
D3. Recipe for mordant (?)

Figure D.3. Recipe for mordant (?) (fol. 79r)

Transliteration

Pera isto medes tomaras cal virgen | e 'geitalos de antenoite em agua e | em aquel'agua molioaras um pano (?)
de cor | e da-lhe (?) ua mano ante que sega [seque] o | coiro posto eno livro ...boa.

Translation

For this measure you shall take quicklime and put them during the night in water and in that water soak a cloth (?) of colour and give it a hand before it dries the leather placed in the book ... good.
## APPENDIX E

### MOST RELEVANT CODICIOLOGICAL FEATURES OF THE Ms. PARMA 1959

<table>
<thead>
<tr>
<th>U.</th>
<th>Folia</th>
<th>Subject</th>
<th>Lang.</th>
<th>Lines</th>
<th>WM.</th>
<th>Justification</th>
<th>Trimm.</th>
<th>CW.</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1r-20r</td>
<td><em>Livro das Cores</em></td>
<td>PT</td>
<td>17</td>
<td>crown</td>
<td>r</td>
<td>1.5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>20v-28r</td>
<td>Calendar of regular and leap years</td>
<td>HE</td>
<td>18</td>
<td>crown</td>
<td>r</td>
<td>2</td>
<td>c.3</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>28v</td>
<td>Recipe for stag’s glue</td>
<td>PT</td>
<td>9</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>28v</td>
<td>Recipe for size</td>
<td>PT</td>
<td>9</td>
<td>__</td>
<td>__</td>
<td>__</td>
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<td>0.5</td>
</tr>
<tr>
<td>5</td>
<td>29r-30v</td>
<td>Scriptural passages for tefillin</td>
<td>HE</td>
<td>15-24</td>
<td>crown</td>
<td>r</td>
<td>variable</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>31r</td>
<td>Notes on the <em>masorah</em></td>
<td>HE</td>
<td>19</td>
<td>__</td>
<td>__</td>
<td>c.2</td>
<td>3.5</td>
<td>1.5</td>
</tr>
<tr>
<td>7</td>
<td>31v-34r</td>
<td>Commentary on Ecclesiastes</td>
<td>HE</td>
<td>17</td>
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<td>__</td>
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<td>Midrashic extract</td>
<td>HE</td>
<td>17</td>
<td>__</td>
<td>__</td>
<td>r</td>
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<td>3</td>
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<tr>
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<td>37r-77v</td>
<td>Asher b. Jehiel: <em>Asheri</em> (laws of ST&quot;M)</td>
<td>HE</td>
<td>17</td>
<td>crown</td>
<td>r</td>
<td>ring ox head scissors column</td>
<td>c.2</td>
<td>3</td>
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<td>HE</td>
<td>26</td>
<td>__</td>
<td>__</td>
<td>r</td>
<td>2</td>
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<td>__</td>
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<td>16</td>
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<td>r</td>
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<td>r</td>
<td>c.1.5</td>
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<td>210v-211v</td>
<td>Sefer ha-Mikhlo (Extract)</td>
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Table E.1. Most relevant codicological features of the Ms. Parma 1959
APPENDIX F

MAIN PALAEOGRAPHICAL FEATURES OF THE MS. PARMA 1959

F1. ANALYSIS OF THE PALAEOGRAPHICAL UNITS OF THE MS. PARMA 1959

1. O Livro de Como de Fazem as Cores das Tintas (foll. 1r-20r)

(i) Average height of the sentences: c. 25 mm.


(iii) Left margin devices: several devices (dilatation of letters, writing exceeding words diagonally, spacing last words).

(iv) Name of God: non-applicable.

(v) Additional features: Diacritical system (niqqud) is not employed, although there is a specific notation for the letters that represent more than one sound such as bet and peh. Some ligatures: aleph/lamed; aleph/vav. Heh when final is more cursive, especially if preceded by aleph. Distinctive letters: stylised heh; particular shin when at the end of a sentence. Predominant aleph: semi-cursive, although the current semi-cursive and the cursive aleph are also present, especially in the last pages of the Livro das Cores.

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398 On fol. 1r there is a marginal note written in a different script that seems to be more recent. We have decided to exclude it from our study as it is not relevant to the determination of the number of hands or its classification.
2. Calendar of regular and leap years with lists of Torah readings (foll. 20v-28r)

![Image of Calendar of regular and leap years with lists of Torah readings](image)

*Figure F.2. Palaeographical specimen of the Calendar of regular and leap years, fol. 26v*

(i) **Average height of the sentences**: c. 30 mm.

(ii) **Mode of script**: This second palaeographical unit is also written in a careful and uniform hand using the traditional Sephardic semi-cursive script. Textual divisions in square script. Catchwords written in the same script of the text.

(iii) **Left margin devices**: Some examples of dilation of final letters.

(iv) **Name of God**: non-applicable.

(v) **Additional features**: Abundant use of abbreviation signs (dots) due to the nature of the text. There are very few erasures and corrections. Predominant *aleph*: semi-cursive (other shapes mostly absent). Some examples of stylised final *heh* and *tav*. Slight inclination to the right.
3. Recipe for glue from stag’s horn (fol. 28v)

Figure F.3. Palaeographical specimen of the Recipe for stag’s glue, fol. 28v

(i) Average height of the sentences: 30 mm.

(ii) Mode of script: The script used is a current semi-cursive script.

(iii) Left margin devices: No particular device.

(iv) Name of God: non-applicable.

(v) Additional features: Abundant use of ligatures, particularly to represent single letters (in Portuguese) such as “o” and “i”. Three types of aleph, written according to their position in the word: (1) semi-cursive in the beginning of words; (2) current semi-cursive in the end; (3) cursive in the beginning and middle of words.

4. Recipe for size (fol. 28v)

Figure F.4. Palaeographical specimen of the Recipe for size, fol. 28r
(i) Average height of the sentences: 50 mm.
(ii) Mode of script: Cursive script.
(iii) Left margin devices: No particular devices.
(iv) Name of God: non-applicable.
(v) Additional features: The letters are larger, the writing is quick and with many erasures.

This recipe is written in Portuguese and the transliteration system used is similar to the previous recipe and to the *Livro das Cores*. However, the corpus of Hebrew letters used is even smaller (e.g. there are no representations of the letter *heh*). The predominant *aleph* is cursive.

5. Scriptural passages to be written in *tefillin* (foll. 29r-30v)

![Image of Scriptural passages for tefillin]

Figure F.5. Palaeographical specimen of *Scriptural passages for tefillin*, fol. 30r

(i) Average height of the sentences: 20 mm.
(ii) Mode of script: square script (ktav ST”M). This is the only text in the Ms. Parma 1959 written in this script.
(iii) Left margin devices: Dilatation of final letters.
(iv) Name of God: אלוף.
(v) Additional features: Text written in small letters most likely due to the nature of the text, as *tefillin* were written in almost micrographic script. Irregular margins and number of lines. *Aleph* is necessarily square.
6. Notes on the Masorah (fol. 31r)

6.1. Hand One (lines 1-3)

Figure F.6. Palaeographical specimen of Hand A on the Notes on the masorah, fol. 31r

(i) Average height of the sentences: 20 mm.
(ii) Mode of script: Semi-cursive.
(iii) Left margin devices: no particular devices.
(iv) Name of God: non-applicable.
(v) Additional features: Only the semi-cursive aleph is used.

6.2. Hand Two (lines 3-9)

Figure F.7. Palaeographical specimen of Hand B on the Notes on the masorah, fol. 31r

(i) Average height of the sentences: 18 mm.
(ii) Mode of script: Current semi-cursive.
(iii) Left margin devices: no particular devices.
(iv) Name of God: non-applicable.
(v) Additional features: Threefold application of the letter aleph. Some similarities with the Recipe for stag horn's glue, although the semi-cursive aleph is equally used in the middle and in the end.

We have identified at least four different hands, although this number could be higher.
6.3. Hand Three (lines 9-19)

(i) Average height of the sentences: 26 mm (first half); 18 mm (second half)
(ii) Mode of script: Irregular cursive script.
(iii) Left margin devices: no particular devices.
(iv) Name of God: non-applicable.
(v) Additional features: Use of ligatures (due to the cursive nature of the script). Cursive aleph.

7. Commentary on Ecclesiastes 9: 14-10:2 (foll. 31v-34r)

(i) Average height of the sentences: 30 mm.
(ii) Mode of script: Regular current semi-cursive. Letters written very closely due to the cursive nature of the script. Textual divisions written in a semi-cursive script and catchwords in cursive.
(iii) Left margin devices: Dilatation of final letters; spacing of last letters.

(iv) Name of God: א

(v) Additional features: Slight inclination towards the left. Two coexistent alephs: (1) current semi-cursive in the end; and (2) cursive in the beginning and middle of words. Other specificities include an elongated kof with a slight curve upwards.

8. Midrashic extract (foll. 34v-35r)

(i) Average height of the sentences: 40 mm.

(ii) Mode of script: Regular current semi-cursive. Textual divisions are written in current semi-cursive.

(iii) Left margin devices: Some final letters dilatation.

(iv) Name of God: א

(v) Additional features: Slight inclination towards the left. Aleph: current semi-cursive (end of words) and current (beginning and middle). Elongated lines of longer letters in lower lines.

Figure F.10. Palaeographical specimen of the Midrashic extract, fol. 34v

Figure F.11. Palaeographical specimen of Asher b. Jehiel’s Asheri, fol. 39r

(i) Average height of the sentences: 30 mm.


(iii) Left margin devices: A few dilated letters; abbreviations

(iv) Name of God:

(v) Additional features: The first folia are difficult to read. The beginning of the text is more cursive than the ending. Aleph: semi-cursive is inexistet; current semi-cursive at the end of words and cursive in the beginning and middle. Use of elongated letters in the lower lines but different from previous units. Several ink (and writing instrument) transitions, but most likely same hand throughout the text.

10. Poem “Yesod ha-sod ve-sod ha-yasod” (fol. 78r)

Figure F.12. Palaeographical specimen of the poem on fol. 78r
(i) Average height of the sentences: 30 mm.
(ii) Mode of script: Regular semi-cursive.
(iii) Left margin devices: A few dilated letters.
(iv) Name of God: Non-applicable.
(v) Additional features: The only aleph used is semi-cursive. Letters more angular and
with more detail (especially in the upper lines). Letters quite straight and aligned. Specific shin.
Different hand from the previous units.

11. Recipe for a “beautiful colour” and recipe for mordant (fol. 79r)

![Figure F.13. Palaeographical specimen of the recipes on fol. 79r](image)

(i) Average height of the sentences: 40 mm.
(ii) Mode of script: Cursive script.
(iii) Left margin devices: No particular device.
(iv) Name of God: Non-applicable.
(v) Additional features: Common sign on top of the two pages (foll. 28v and 79r). Slight
inclination towards the left.

![Image of Sefer ha-Manhig]

Figure F.14. Palaeographical specimen of Sefer ha-Manhig, fol. 8or

(i) Average height of the sentences: c. 40 mm.
(ii) Mode of script: Current semi-cursive script. Textual divisions in the same script, although some in semi-cursive script (fol. 94r, etc.) and square script (fol. 104r, etc.).
(iii) Left margin devices: Final letters dilated (used irregularly).
(iv) Name of God: 
(v) Additional features: Slight inclination towards the left. Ornamentation and prolonging of higher letters in some lower lines. Current semi-cursive and cursive aleph.

13. Extract from Maimonides' Mishne Torah (Sefer Madda) (foll. 139r-140v)

![Image of Extract from Maimonides' Mishne Torah]

Figure F.15. Palaeographical specimen of Extract from Maimonides' Mishne Torah, fol. 139r

(i) Average height of the sentences: 30 mm.
(iii) Left margin devices: No particular devices.
(iv) Name of God: א"ת

(v) Additional features: Absence of the semi-cursive aleph. Slight inclination towards the left.

14. Legend about the Septuagint (foll. 141r-142r)

![Legend about the Septuagint](image)

Figure F.16. Palaeographical specimen of Legend about the Septuagint, fol. 141r

(i) Average height of the sentences: c. 30 mm.

(ii) Mode of script: Current semi-cursive

(iii) Left margin devices: Dilatation of final letters (not always); writing of exceeding words vertically.

(iv) Name of God: א"ת

(v) Additional features: Absence of semi-cursive aleph.

15. Mishne Torah (foll. 142v-184r)

![Mishne Torah](image)

Figure F.17. Palaeographical specimen of the Mishne Torah, fol. 142v
(i) **Average height of the sentences:** c. 30 mm.
(ii) **Mode of script:** Current semi-cursive. Textual divisions written in semi-cursive script and the title in square script.
(iii) **Left margin devices:** Dilatation of final letters; vertical writing of exceeding words; writing exceeding letters above the end of the line.
(iv) **Name of God:** יִהְיֶה
(v) **Additional features:** Slight inclination towards the left. **Aleph:** semi-cursive only when **aleph** dilated (with typical left line elongated); current semi-cursive in the end of words and cursive in the beginning and middle. Some examples of the typical ornamented and longer letters in lower lines; typical final **tav**. Marginal note on fol. 177v could be written by a different hand; other marginal notes similar to the main text but written in semi-cursive script.

16. **List of oddly shaped letters found in an accurate Torah scroll (foll. 184v-195r)**

(i) **Average height of the sentences:** c. 30 mm.
(ii) **Mode of script:** semi-cursive with the use of **taggin** and special letters, table 1. Textual divisions written in the same semi-cursive script and so are catchwords.
(iii) **Left margin devices:** Dilatation of final letters.
(iv) **Name of God:** יִהְיֶה
(v) **Additional features:** Inclusion of special letters known as “anomalous”; **taggin** are abundantly used. Predominant **aleph:** semi-cursive (others non-existent).
17. Rhymes about grammar (fol. 196r)

(i) Average height of the sentences: 30 cm.
(ii) Mode of script: Semi-cursive.
(iii) Left margin devices: Some letters dilatation.
(iv) Name of God: non-applicable.
(v) Additional features: Niqqud applied; some ligatures (with heh). Semi-cursive aleph.

18. Liturgical poems (baqashot and pizmonim) (foll. 197r-209r)

(i) Average height of the sentences: c. 30 mm.
(ii) Mode of script: Semi-cursive. The last folia are already mostly written in a current semi-cursive script. Textual divisions written in the same semi-cursive script. Marginal notes written by the same hand but letters are more condensed.
(iii) Left margin devices: Dilatation of last letters; writing of exceeding words diagonally and vertically.
(iv) Name of God:

(v) Additional features: ornamented final heh and final tav. A few elongated longer letters in lower lines. Textual addition on fol. 206v. Threefold application of aleph.

19. Extract from Sefer ha-Mikhlo (foll. 210v-211v)

![Image of text]

Figure F.21. Palaeographical specimen of the Sefer ha-Mikhlo, fol. 210v

(i) Average height of the sentences: c. 30 mm.
(iii) Left margin devices: Dilatation of final letters.

(iv) Name of God: א

(v) Additional features: Presence of some ligatures (aleph-vav); predominant aleph: semi-cursive (beginning and middle of words).
## Table of the General Palaeographical Features of the Ms. Parma 1959

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<td>current s.-curs.</td>
<td>square</td>
<td>30</td>
<td>- dilatation final letters</td>
<td>י</td>
<td>- final tav - final heh</td>
<td>- semi-cursive (others almost absent)</td>
<td>N</td>
</tr>
</tbody>
</table>

Table F.2. General palaeographical features of the Ms. Parma 1959
# G1. Description of the chapters in the Livro das Cores

<table>
<thead>
<tr>
<th>Ch.</th>
<th>Title</th>
<th>Ch.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation and tempering of mosaic gold</td>
<td>24</td>
<td>Making and tempering turnsole</td>
</tr>
<tr>
<td>2</td>
<td>Preparation and tempering of mosaic gold</td>
<td>25</td>
<td>Laying gold leaf</td>
</tr>
<tr>
<td>3</td>
<td>Laying gold leaf</td>
<td>26</td>
<td>Tempering blue</td>
</tr>
<tr>
<td>4</td>
<td>Attrition gilding</td>
<td>27</td>
<td>Making and tempering rose (brazil); tempering indigo and black ink</td>
</tr>
<tr>
<td>5</td>
<td>Making silver blue</td>
<td>28</td>
<td>Tempering green</td>
</tr>
<tr>
<td>6</td>
<td>Tempering silver blue</td>
<td>29</td>
<td>Tempering blue</td>
</tr>
<tr>
<td>7</td>
<td>Tempering ultramarine blue</td>
<td>30</td>
<td>Tempering carmine</td>
</tr>
<tr>
<td>8</td>
<td>Making and tempering rose (from brazil)</td>
<td>31</td>
<td>Tempering saffron</td>
</tr>
<tr>
<td>9</td>
<td>Making another rose (from brazil)</td>
<td>32</td>
<td>Tempering orpiment</td>
</tr>
<tr>
<td>10</td>
<td>Making red lead (from lead white)</td>
<td>33</td>
<td>Tempering indigo</td>
</tr>
<tr>
<td>11</td>
<td>Making verdigris (from copper)</td>
<td>34</td>
<td>Tempering blue</td>
</tr>
<tr>
<td>12</td>
<td>Making and tempering another verdigris (from brass)</td>
<td>35</td>
<td>Mixing colours</td>
</tr>
<tr>
<td>13</td>
<td>Making carmine (lac)</td>
<td>36</td>
<td>Laying gold leaf</td>
</tr>
<tr>
<td>14</td>
<td>Making another carmine (recipe misses the colorant)</td>
<td>37</td>
<td>Mixing blue and carmine</td>
</tr>
<tr>
<td>15</td>
<td>Making vermilion</td>
<td>38</td>
<td>Laying gold leaf</td>
</tr>
<tr>
<td>16</td>
<td>Gilding swords or knives</td>
<td>39</td>
<td>Burnishing gold and silver leaf</td>
</tr>
<tr>
<td>17</td>
<td>Dyeing bone or wood (black)</td>
<td>40</td>
<td>Making glue from parchment</td>
</tr>
<tr>
<td>18</td>
<td>Dyeing bone or wood (red)</td>
<td>41</td>
<td>Making ochre colour by mixture of vermillion with orpiment</td>
</tr>
<tr>
<td>19</td>
<td>Dying wood (black)</td>
<td>42</td>
<td>Making varnish</td>
</tr>
<tr>
<td>20</td>
<td>Dyeing bone or wood (green)</td>
<td>43</td>
<td>Making adherent water for gold leaf</td>
</tr>
<tr>
<td>21</td>
<td>Making bone pulp for chess pieces</td>
<td>44</td>
<td>Making and tempering rose (from brazil)</td>
</tr>
<tr>
<td>22</td>
<td>Missing chapter</td>
<td>45</td>
<td>Making green lake (from lily)</td>
</tr>
<tr>
<td>23</td>
<td>Missing chapter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table G.1. Chapters in the Livro das Cores
G2. Expected results from the procedures described in the *Livro das Cores*

<table>
<thead>
<tr>
<th>Main result</th>
<th>Colour</th>
<th>Recipe number</th>
<th>Sub-total</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yellows and gold</strong></td>
<td>Yellows</td>
<td>(1), (2), (25), (31), (32), (41)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gold leaf</td>
<td>(3), (36), (38), (39)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gold</td>
<td>(4), (16)</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td><strong>Blues</strong></td>
<td>Indigo</td>
<td>(24), (27), (33), (35)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other blues</td>
<td>(5), (35), (37)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tempering</td>
<td>(6), (7), (26), (29), (34)</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td><strong>Reds</strong></td>
<td>Vermilion</td>
<td>(15), (35)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carmine</td>
<td>(13), (14), (18), (30), (35), (37)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red lead</td>
<td>(10), (35)</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td><strong>Roses</strong></td>
<td>Brazilwood</td>
<td>(8), (9), (27), (44)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Greens</strong></td>
<td>Verdigris</td>
<td>(11), (12), (20)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other greens</td>
<td>(28), (45)</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Blacks</strong></td>
<td>Pigment</td>
<td>(27),</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Colour</td>
<td>(17), (19), (21)</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

| Glue     | Animal glue | (3), | 1 |       |
|          | Parchment glue | (40), | 1 |       |
|          | Bran glue | (43), | 1 | 3     |
| Varnish  |          | (42), | 1 |       |

**Table G.2. Expected results**

<table>
<thead>
<tr>
<th>sub-total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47</td>
</tr>
<tr>
<td>sub-total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51</td>
</tr>
</tbody>
</table>