This practice was used in Italy as early as 1280, but until the third quarter of the fourteenth century, only in a small part of the dated manuscripts. With one exception (dated 1314), all the nine manuscripts employing this practice from 1280 up to 1324 (and all the seven manuscripts dated until 1313) have a number of sheets in a quire which differs from the usual number prevalent in the rest of the Italian manuscripts: While the common composition in Italy was 5 sheets, five of these manuscripts have quires of 6 sheets and the other three (dated 1292, 1313, 1324) have 4 sheets in a quire. Furthermore, in some of them the ruling techniques also differ from the common Italian technique. After 1324, up to the seventies of the fourteenth century no manuscript employing this practice has so far been found. Thereafter the practice was again in use, and in the fifteenth century starting with the flesh-side became very common in Italy and turned out to be the dominant method.

In <em>Sefarad</em> this practice was employed only rarely in the fourteenth and the fifteenth centuries.<sup>69</sup>

The practice is not found in French or early German manuscripts (in which the parchment retains the difference between the two sides), and not in the Orient and Byzantium.<sup>70</sup>

The outer parchment sheets in parchment-paper manuscripts are also arranged in accordance with Gregory's Rule. In all areas each quire of this kind in all the manuscripts starts with the hair-side; the last page of each quire and the first page of the following one both show the hair-side. In most manuscripts with quires that also have an inner sheet of parchment, the opening of each inner sheet also shows the hair-side, which means that the paper sheets were put between external hair-side parchment sheets before folding. However, in some manuscripts of this kind, mainly those written in Byzantium and a few written in Italy, the opening of the inner parchment sheets shows the flesh-side.

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68 MS Parma, Biblioteca Palatina 2052 (De-Rossi 667), written probably in Rome (HPP E422).
69 The earliest manuscript is MS Paris, Bibliothèque nationale hsb., 20, written in Tudela in 1300 (cf. Sirat–Beit-Arié, <em>Manuscripts médievaux</em>, I, 26).
70 In all the Byzantine Hebrew manuscripts written on parchment studied — only 10 manuscripts in all, dated from 1298 on — the quire starts with the hair-side, while the quires of Greek Byzantine manuscripts start with the flesh-side. See Gregory, <em>loc. cit.</em>; Irligion, <em>Scriptorium</em>, XII (1998), p. 220. Early Latin manuscripts also start with the flesh-side; cf. E.A. Lowe, <em>CLA</em>, I, Oxford 1934, p. x.

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2. VARIOUS COMPOSITIONS OF QUIRES

3 sheets (6 leaves)

This exceptional composition is found only in a few <em>Sefarad</em> manuscripts. Of the eight manuscripts found to use this practice, five were written in Toledo until 1300,<sup>71</sup> and two other unlocalized manuscripts of the same period can be ascribed to the Toledo school.<sup>72</sup> Therefore, it seems that this practice was a peculiar local tradition in Toledo until about 1300,<sup>73</sup> co-existing together with the common <em>Sefarad</em> practice of 4 sheets in the second half of the thirteenth century.

4 sheets (8 leaves)

Apart from some very few exceptions this is the common composition of quires in <em>Ashkenaz</em> from the earliest manuscripts up to the end of the Middle Ages.

In addition to <em>Ashkenaz</em>, quires of 4 sheets are common also in <em>Sefarad</em>. In parchment manuscripts this composition is the usual one throughout the Middle Ages, and almost the only one until the end of the thirteenth century, but in paper manuscripts it is found very rarely.

This is the only composition used in the few extant Byzantine parchment manuscripts (some ten manuscripts), dated from 1298 on, but it is also used in part of the Byzantine paper manuscripts.

In the Orient such a composition is uncommon,<sup>74</sup> except in Persia and Uzbekistan (Buxkara and Samarkand, now in the U.S.S.R.), where it is found to be apparently the only composition.<sup>75</sup>

71 MS Paris hsb. 105, dated 1197/8 (HPP B26); MS Oxford Kennicott 7 (Neubauer 2331), dated 1222 (HPP C289) and MS New York, JTS L44a (HPP D5), dated 1241 (both written by the same scribe); MS Paris hsb. 20 (HPP BB), dated 1272 (most quires consist of 4 sheets, but some of 3); MS London, British Library Or. 2201 (Margoliouth 52), dated 1300 (HPP C368).
72 MS Parma 2970 (De-Rossi 785), dated 1298 (HPP E430) and MS Marseilles, Bibliothèque municipale 1626, vols. 2-3 (HPP ZB46), which is undated and unlocalized, but its decorations are from the Toledo school (see G. Sed-Rajin, "<em>Toldeo or Bargan?”,Journal of Jewish Art</em>, II, 1975, pp. 6-21).
73 Of insignificant exception is MS Parma 2625 (De-Rossi 960), written in an unidentified place in <em>Sefarad</em> in 1442 (HPP E389).
74 It was found in three manuscripts written in Yemen in the second half of the fifteenth century, whereas Yemenite manuscripts usually have quires of 5 sheets.
75 Among the sixteen existing manuscripts which are localized in, or can be definitely ascribed
In Italy, quires of 4 sheets are rare. Although they can be found as early as 1253, they are in significant use from the end of the fourteenth century on, but quite rarely, and mainly in parchments manuscripts. A considerable number of these manuscripts were written in North Italy (close to Ashkenaz), or by immigrant scribes from Spain and Germany.

5 sheets (10 leaves)

This is the regular composition of quires in the Orient (excluding Persia and Uzbekistan), and in parchment manuscripts in Italy from the earliest dated manuscripts up to the end of the Middle Ages.77

to these areas (all of them from the fourteenth and fifteenth centuries), all the manuscripts in which the composition of the quires can be determined have 4 sheets in a quire. MS Oxford, Bodleian Library Hunt. 567 (Neuhauser 608) [HPP 086], copied in Tabriz (now in Iran) have the usual Oriental composition of 5 sheets. The same applies to MS Leningrad, Public Library, II Firkovitch Hebrew 113 (HPP Y373), written in Khoy in 1303, as can be concluded from the distribution of the catchwords at the end of its quires (according to the photographic reproductions kept in the Institute of Microfilmed Hebrew Manuscripts, Jerusalem, Ph. 2797). These manuscripts may indicate that in Azerbaijan, the north-western part of Persia, an area close to Iraq, the regular Oriental composition was in use. MS Jerusalem, JNUL. Heb. 5767 (HPP A07), which was written in an unidentified place in Persia in 1326, seems to also have a composition of 5 sheets and thus might have been copied in this particular area.

76 MS Paris, Bibliothèque nationale hēb. 163 (HPP 3332); nine quires of this manuscript consist of 5 sheets (the usual composition in Italy), but five quires consist of 4 sheets. All the quires of MS Paris hēb. 182 (Sirat—Beit-Arié, Manuscrits médiévaux, I, 17), dated 1292, consist of 4 sheets.

77 Z. Ben-Hayyim pointed out that the Hebrew Medieval word for quire, querêph, is derived from the medieval Latin quinternus, which is indeed 5 sheets. Cf. The literary and oral tradition of Hebrew and Aramaic among the Samaritans, I, Jerusalem, 1957, p. 99, n. 38 (in Hebrew). Thus, while the Hebrew term echoes the old Oriental tradition of making a quire of 5 sheets, the late Latin term (quaternio, quaternus), the French and the English ones reflect the usual composition of 4 sheets in European Latin manuscripts. Cf. Wattenbach, Das Schrifttum, p. 177; E.M. Thompson, An introduction to Latin and Greek paleography, Oxford, 1912, p. 53. The Irish word for book can also be explained as being derived from quinieron, reflecting the old Irish and insular technique of 5 sheets in a quire, as was pointed out by A.E. Lowe, CLA, II, Oxford, 1935, p. vii. According to Lowe, the composition of 5 sheets was indeed used in early Oriental Latin manuscripts (see also CLA, I, 1934, p. x) and in some old Italian manuscripts as well (cf. CLA, IV, 1947, p. viii).

However, it should be noted that the Hebrew Medieval term, querêph, was coined in Ashkenazic literature, apparently by Rashi (1040-1106). The term may hint that, contrary to the common practice of 4 sheets in a quire employed in all the earliest surviving

Such a composition cannot be found in Ashkenaz78, and it is found very rarely in Sephardic79 and apparently also in Byzantium.80

Ashkenazic manuscripts, dated from the end of the twelfth century on, the usual composition of quires in Ashkenaz in earlier times — at least in the eleventh century — was 5 sheets, like in Italy. If so, some time between the eleventh and the end of the twelfth century, this hypothetical old composition was replaced completely by the composition of 4 sheets.

In Medieval Oriental sources a slightly different term was used — Qurêph (or quêph). This term can be found in many geniza fragments and documents from the eleventh century on, for example: In a letter of a scribe in Dalton (Palestine), ca. 1020-1050, Oxford Heb. c. 13, fol. 14 (Neuhauser-Cowley 2807/14), published by S. Assaf, Milporet ummeqapim bittodot yifra'eh, Jerusalem 1946, p. 40 (in Hebrew), and in an undated colophon of the eleventh century, MS Cambridge, University Library TS 10K18.6 (HPP ZC134). The same spelling occurs in Byzantine documents found in the Cairo geniza: In a letter of the eleventh century (Cambridge TS 20.45), published by J. Mann, Texts and studies, I, Cincinnati 1931, p. 49 (Mann replaced, perhaps unconsciously, the unfamiliar Oriental spelling with the well-known Ashkenazic one in both occurrences of the term); and in a letter written by a Byzantine bibliophile (cf. S.D. Goitein, A Mediterranean society, II, Berkeley — Los Angeles — London 1971, p. 238), Cambridge TS 12.354, published by A. Scheiber, Sefard Oriental Studies, II (1972), p. 411.

78 It can be found in manuscripts written in Ashkenazic hands in Italy. When one finds an unlocalized manuscript written in an Ashkenazic hand, which has 5 sheets in a quire, one should assume that it was produced in Italy; for example: MS Oxford Mich. 600 (Neuhauser 1368), written on paper in 1473 (HPP C197).

79 Unlocalized 5-sheet manuscripts written in Sefardic hands might have been copied in Italy by immigrant scribes. Indeed, we find many localized manuscripts copied in Italy in Sefardic hands, and the composition of their quires conforms to the local Italian method. However, a few localized Spanish manuscripts, written on parchment or paper, show this exclusive Oriental-Italian composition: MS Vaticán Ebr. 418 (HPP E125), copied in Toledo in 1334; MS Milan, Biblioteca Ambrosiana E8 inf. (Bernheimer 46), written in Avignon in 1406 (HPP E49); MS New York, JTS Mic. 2242 (HPP D98), copied in Malaga in 1442; MS Frankfurt, Stadt- und Universitätsbibliothek Hebr. Oct. 112 (HPP G86), written in Salamanca in 1462; MS Paris, Bibliothèque nationale hēb. 788 (Sirat—Beit-Arié, Manuscrits médiévaux, I, 144) and MS Oxford, Bodl. Or. 612 (Neuhauser 1493) [HPP C220], written by the same hand in Granada in 1478 and 1480 respectively; MS Oxford Marshall (Or.) 12 (Neuhauser 1433), written in Lisbon in 1467 (HPP C206).

80 MS Leipzig, Universitätsbibliothek B. H. 16 (HPP G65), written in Constantinople in 1469 seems to have 5 sheets in a quire. MS Oxford Hunt. 309 (Neuhauser 1550), written in 1415 (HPP C229), consists of two parts, one written in Thess (Greece), the other in Philippopolis (Bulgaria); while the part written in Greece has 6 sheets in a quire, the part written in Bulgaria has 5 sheets. Two 5-sheet manuscripts written in Valona (Albania), which was under Venetian rule, in 1384-1385 — MSS London, British Library Or. 832 (HPP C393) and
6 sheets (12 leaves)

This composition is employed in a small part of the parchment manuscripts copied in Sephardi, not before 1275, but it is the most common composition of the paper manuscripts written there. It is also the main composition of paper manuscripts in Byzantium. In Italy it is found in five parchment manuscripts, whose quires start with the flesh-side, written between 1280 and 1304, but the practice was revived in the fifteenth century in paper manuscripts, in which it was the most frequent composition.

In the Orient such a composition is very rare, and the same applies to Ashkenaz.

7 sheets (14 leaves)

This composition is very unusual. Its rare use is restricted to a few paper and parchment-paper manuscripts written in Italy, Sephardi and Byzantium.

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Parma, Biblioteca Palatina 2367 (De Rossi 1139) [HPP E647], both are parchment-paper codices — should be classified within the Italian codicological entity (the scribe of MS London was in fact active mainly in Southern Italy).

81 MS Vatican Rossiano 801 (HPP E145), written in Huesca in 1275, is the earliest Sephardic manuscript found so far to have such a composition.

82 In addition, this is also the composition of half of the quires in MS London Or. 6712 (HPP C365), dated 1287, in which each quire starts with the hair-side (the rest of the quires are composed of 5 or 7 sheets).

83 Only one single parchment manuscript having 6 sheets in a quire has been found so far, but it was copied by a scribe from Provence: MS Vatican Ebr. 262 (HPP E199), written in Naples in 1457.

84 It is found for the first time in an Oriental manuscript written in 1292 — MS Oxford Hunt. 211 (Neubauer 594) [HPP C91] — and later in a few other manuscripts, some of them written in Yemen.

85 The earliest Ashkenazic manuscript found to have quires of 6 sheets is MS London, British Library Harl. 150 (Margoliouth 189), dated 1267 (HPP C358), but about half of its quires have the usual Ashkenazic composition of 4 sheets. Apart from four other parchment manuscripts dated until the beginning of the fourteenth century, such a composition is found in few Ashkenazic paper manuscripts of the fourteenth century.

86 Such is the composition of the quires of the earliest parchment-paper manuscript in Sephardi, dated 1225 (cf. above, note 57).

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8 sheets (16 leaves)

Such a composition is confined to paper or parchment-paper manuscripts written in Italy, Sephardi and Byzantium, where it is used as a secondary composition along with the practice of 6 sheets in a quire.

9 sheets (18 leaves)

This composition is extremely unusual, and it is confined to a few paper or parchment-paper manuscripts produced in Sephardi and Italy.

10 sheets (20 leaves)

Such quires can be found only in Sephardi and Italy, rather frequently in parchment-paper manuscripts, but very rarely in paper manuscripts.

11-14 sheets (22-28 leaves)

Such compositions are extremely rare. All of them can be found in a few parchment-paper manuscripts written in Sephardi, 11-12 sheets are also found in Italian parchment-paper manuscripts. Such large compositions were sometimes used in these entities in paper manuscripts as well: 11-13 sheets in Italy, 12 and 14 sheets in Sephardi.

As we can notice the quires of parchment manuscripts in all regions are found to consist mostly of uniform compositions — 4 sheets in Ashkenaz, Sephardi and Byzantium, and 5 in the Orient and Italy. Everywhere parchment quires are limited to no more than 6 sheets. Paper quires adhere to the same local practices in the Orient and Ashkenaz, while they show a variety of compositions in Sephardi, Italy and Byzantium: 4-10 and 12 sheets in Sephardi, 5-10 and 12 sheets in Italy, 4-8 sheets in Byzantium. Parchment-paper manuscripts in Sephardi, Italy and Byzantium show an even larger variety of compositions.

87 An exceptional parchment manuscript is MS Cambridge, University Library Add. 1564 (HPP C024), written probably in France in 1243, but the parchment on which it was copied is unusually thin, and therefore the scribe doubled the usual Ashkenazic composition of 4 sheets.
3. GEO-CULTURAL CLASSIFICATION OF THE COMPOSITIONS OF QUIRES

Orient

Throughout the Middle Ages, with only a few exceptions, 5 sheets in parchment as well as paper manuscripts, but in Persia and Uzbekistan — 4 sheets.

Ashkenaz

At all periods, with only a few exceptions, 4 sheets in parchment and in paper manuscripts.

Italy

The regular composition in parchment manuscripts was 5 sheets from the earliest manuscripts up to the end of the Middle Ages. Between 1280 and 1324, a few manuscripts were composed of quires of 4 or 6 sheets, all of them starting with the flesh-side. From the end of the fourteenth century on, a considerable number of parchment manuscripts, part of them written by immigrant scribes from Ashkenaz and Sefarad, have quires of 4 sheets.

Paper manuscripts show from the very beginning a divergence from the usual Italian composition of parchment manuscripts. Up to the end of the Middle Ages paper quires had no uniform composition, but a variety of compositions: 5, 6 or 8 sheets, and only rarely 7 and 10-13 sheets. 6 sheets in a quire is slightly more frequent than 8 sheets, and 5 sheets is a little less frequent, but during the years 1470-1488, quires of 5 sheets are dominant for some reason.

Parchment-paper manuscripts show greater variety, from 6 to 12 sheets, but 8 and 10 sheets are most frequent.

Sefarad

The usual composition of the quires of parchment manuscripts is 4 sheets. In early manuscripts this was the only composition, apart from manuscripts written in Toledo, where a local tradition of 3 sheets in a quire was practiced

![Image](image_url)

88 But cf. above, note 82.
89 The earliest Italian manuscript of this kind, dated 1312 (cf. above, note 22), has 6 sheets in each quire.
90 Such is the composition of the quires of the earliest dated manuscript of the Sefaradica entity, MS Leningrad, written in Gades (Tunisia) in 846 (cf. above, note 10). MS Leningrad, Institute of Oriental Studies 602, claimed to be the earliest Hebrew codex (cf. above, note 11), has quires of 4 sheets, which may indicate its North African origin.

91 Two old undated manuscripts (written ca. 1000), which should be ascribed to Byzantium, have quires of 4 sheets: MS Oxford, Bodleian Library Heb. d.3 (Neubauer-Cowley 2614), in which the Haftorot according to the Greek Jewish rite are copied (cf. the Catalogue) and MS Cambridge, Fitzwilliam Museum 364*, a Biblical manuscript with Judeo-Greek glosses.
CHAPTER FOUR
MEANS OF PRESERVING THE ORDER OF QUIRES, SHEETS AND LEAVES

The variety of means employed by Hebrew scribes in order to ensure the correct order of the codex can be divided into two main groups: catchwords, including all kinds of repeating words 92 of the copied text, and signatures, including various methods of numerating quires or leaves. In all areas both practices were used, usually simultaneously in the same manuscript, but in Ashkenaz signatures or other kinds of numbering were not employed.

In general, the means employed in parchment manuscripts tend to differ from those employed in paper manuscripts in all areas apart from the Orient. While in parchment manuscripts only means of preserving the correct order of the quires are usually used, in paper manuscripts, which are more vulnerable, scribes tend to employ additional means in order to ensure also the order of the sheets or leaves, and on rare occasions, even pages. Naturally, the latter means were invented later.

It is known from Latin palaeography that signatures of quires preceded catchwords, which were employed for the first time in the ninth century. 93 Lack of dated Hebrew manuscripts before the end of the ninth century prevents us from knowing the development of the means of ensuring the right order of the codex, and whether signatures preceded catchwords in Hebrew manuscripts too.

Neither signatures nor catchwords can be found in the earliest dated Hebrew codex written in Tiberias in 894/5, nor do they appear in the other early Oriental manuscripts copied before the eleventh century, but they may have been cut off when margins were trimmed. However, the earliest Oriental manuscript with surviving means for keeping the order of the quires, MS Leningrad, Public Library B19a, written in Cairo in 1009, has both means, that of numerating the quires (signatures), and that of writing the first word of the quire at the foot of the last page of the preceding quire (catchwords).

Absence of any mean of keeping the order of the codex characterizes part of the early Sephardic parchment manuscripts, but traces of catchwords are already found in MS Leningrad, Public Library, II Firkovitch 124, written in Gables (Tunisia) in 946. 94

1. CATCHWORDS AND REPEATED WORDS

Repeating of words at the end or at the beginning of quires, sheets or leaves is the main means employed in Hebrew manuscripts in all regions from earliest times in Europe and from about the beginning of the thirteenth century in the Orient.

There are two ways of implementing catchwords. The most common way is by repeating the first word or first few words of some unit of the codex (quire, sheet, leaf) at the foot of the preceding page. The second way is by repeating the last word of the quire or the leaf at the beginning of the following page. Only in the first technique are catchwords placed separately from the text, while in the second technique the catchwords are incorporated in the copied text. We shall differentiate between these two ways by applying the term "catchwords" to the first one alone, while the second way will be signified by the term "repeated words".

A. Catchwords

Catchwords are always placed at the foot of the page, usually horizontally around the right vertical bounding line. In the Orient, apparently from the middle of the thirteenth century on, catchwords are frequently written diagonally downwards (see Plates 8, 15). In Ashkenaz, catchwords are sometimes written horizontally in the middle of the lower margins, 95 or vertically along the right vertical bounding line (see Pl. 9).

92 An unusual practice of repeating graphic signs instead of catchwords is found in an undated manuscript written in an Ashkenazic hand of the fifteenth century (MS New York, JTS L873). Different forms are drawn at the foot of each verso and are repeated at the head of the following recto.
95 The earliest practice of such a placing is found in MS London, British Library Ar. Or. 2 (Margoliouth 68), written in 1216 (HPP C352).
Catchwords were generally decorated, usually very simply by points or dots. In Ashkenaz, mostly during the fourteenth century, catchwords were quite often illustrated by pen; the favorite illustrations were animal designs (see Pl. 10). Catchwords were sometimes illustrated in late Italian manuscripts (see Pl. 11). In Byzantium, catchwords were sometimes illustrated crudely with bizarre bird designs (see Pl. 12).

When catchwords were later employed on each verso page, or on each verso page of the first half of the quire, the catchwords at the foot of the last page of the quires were sometimes produced differently, either by different placing, by decoration, or by a different script.

1. Catchwords at the end of the quires

The first word of a quire is repeated at the foot of the last page of the preceding quire. This is the most usual practice in European and North African parchment manuscripts from early times on, while in paper and parchment-paper manuscripts catchwords were used for each sheet or leaf.

In the Orient, part of the manuscripts written before 1222 have no catchwords but only numeration of quires. In Ashkenazic parchment manuscripts this practice was almost always the sole means of ensuring the right order of a codex.

2. Catchwords at the end of each leaf

Implementing catchwords on each leaf had already been introduced in the Orient, Sefarad and Byzantium in the thirteenth century, but became the usual practice only later.

In the West the spread of this practice followed the growing use of paper for books. Thus, the practice was first adopted in Sefarad, where it was widespread from the beginning of the fourteenth century, later, in the fifteenth century, in Italy, and only rarely in Ashkenaz in the second half of the century.

In the Orient, where paper was the main writing material as early as the eleventh century, this practice was employed considerably only in the second half of the fourteenth century, but mainly in the fifteenth century. Only in Byzantium is the practice used in almost all the extant dated manuscripts, as early as the earliest one (dated 1298).
The earliest manuscript in which such a practice was employed was written on parchment-paper quires in Alexandria by Byzantine scribe, but such catchwords were employed here only occasionally, without any regularity. In Sefarad, the practice is found for the first time in a parchment-paper manuscript dated 1225, but it was employed only in the first half of the quire (see below). The earliest Sefaradic manuscript found to employ catchwords at the foot of each leaf of the quire was written in Tarsos (Provence) in 1284. The earliest Oriental codex, written by an Oriental scribe, in which this practice is employed throughout, was copied in Mardin (Turkish Kurdistan) in 1292. The earliest Ashkenazic manuscript found to use this means is also the earliest Ashkenazic manuscript on paper found so far, dated 1337, but as was said above, this practice was rarely employed in Ashkenaz.

In Italy this technique cannot be found before the end of the fourteenth century. Almost all the Italian manuscripts in which catchwords are implemented on each leaf were written either in South Italy in Sefaradic or Byzantium hands, or in North Italy by Sefaradic or Ashkenazic scribes. Therefore it seems that this practice was generally rejected by genuine Italian scribes. As in Sefarad, the earliest use of this practice in Italy also has a modified form: catchwords are employed for the first time only on the verso sides of the first half of each quire in a parchment-paper manuscript dated 1371, written in South Italy or Sicily in a Sefaradic type of script.

Quite frequently, scribes write catchwords only at the foot of each verso in the first half of the quires. Naturally, catchwords are written also at the foot of the last verso of each quire. While catchwords written on each verso of the quire ensure the order of each leaf independently, this modified practice ensures the order of each sheet in the quire. Those scribes who use this practice tend indeed to exclude the last sheet, so catchwords are not found on the verso page of the openings of the quires.

3. Catchwords at the end of each page

Such a practice was employed very rarely in the Orient and Italy at the end of the Middle Ages, mostly in manuscripts employing catchwords at the foot of each leaf. So far it has been found in regular use only in one manuscript (and only by one of its two scribes), copied in Damascus in 1468.

Sometimes a similar practice can be found in Ashkenazic manuscripts of the fourteenth century on, in which various commentaries and glosses are copied around the basic text. Catchwords are placed at the foot of the columns in order to assist the reader to locate the continuations of the different texts, but only as a secondary means alongside the repetition of words.

B. Repeated words

This means is a slight modification of the catchwords technique. Instead of rewriting the first word of a quire or a leaf at the foot of the preceding page, the last word of a quire or a leaf is repeated at the beginning of the following page. Words of the copied text serve as a guide for preserving the correct order of the codex in this practice too, without being placed outside the disposition of the written space.

The practice is employed less frequently than catchwords are. It is used in the same manner as catchwords are implemented, at the beginning of each quire, or each leaf, or each leaf of the first half of the quire, or, sometimes, at the beginning of each page or columns of glosses.

The geographical distribution of such a practice is quite similar to that of the catchwords technique, but it was employed frequently only in Sefarad. It is generally practiced at the beginning of each leaf, and only rarely is it implemented at the beginning of each quire alone.

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96 Cf. above, note 56. This practice is one of two practices employed in this manuscript. The other one is that of repeating the last word of the leaf.

97 MS Parma, Biblioteca Palatina 3239 [De-Rossi 266] [HPP E424]. The catchwords written at the foot of each verso page are smaller than those written at the end of the quires, and the latter alone are decorated.

98 MS Oxford, Bodleian Library Hunt. 164 (Neubauer 1249) [HPP C174].

99 Cf. above, note 23.

100 MS Paris, Bibliothèque nationale hlb. 673 (Siret–Bilt-Arié, Manuscrits médiévaux, I, 47), written in Gerace (South Italy) or Geraci (Sicily).

101 MS Oxford Pap. 203 (Neubauer 1632) [HPP C100], in the part written by the first scribe; the second scribe wrote catchwords on each verso. In MS Nîmes, Bibliothèque municipale 365 (Siret–Bilt-Arié, Manuscrits médiévaux, I, 106), which was copied in Italy in 1454 by a scribe originating from Provence, catchwords are placed below each first column of the two columns in a page, apart from catchwords placed at the foot of each verso of the first half of the quire (excluding the last verso). In MS New York, JTS Mic. 5512 (HPP D132), written in Italy in 1292, catchwords are written on some recto pages.
The earliest use of this practice is found in an Oriental manuscript written in 1112, in which it is employed at the beginning of each quire, in addition to signatures. In a manuscript written in 1212 in Alexandria, it is partly employed at the beginning of recto pages. In Sefarad the practice is found for the first time in the first half of each quire in a parchment manuscript dated 1214, and in Italy, at the beginning of each quire written by one of the scribes of a parchment manuscript in Salerno in 1268. In Byzantium it was apparently employed at the beginning of recto pages from the end of the fourteenth century on, while in Ashkenaz it was used mostly in copying columns of glosses and commentaries from the fourteenth century on.

In general, repeated words were practiced rather frequently only in Sefarad, from the end of the thirteenth century, mostly at the beginning of each leaf, and many times together with catchwords, in paper as well as parchment manuscripts. The practice was employed particularly in Provence. In Italy and Byzantium, it appears less frequently, but in a considerable number of manuscripts from the end of the fourteenth century on it is found at the beginning of each leaf. In Italy, as in Sefarad, it was sometimes employed only in the first half of the quire, and sometimes as an alternative means to catchwords. The practice was rarely used in the Orient and in Ashkenaz.

2. NUMERATION OF QUIRES, SHEETS, LEAVES AND PAGES

The second main way of ensuring the right order of a codex is by numbering, usually by Hebrew letters. Signatures, the commonest means of this kind, number the quires. The other means, those of numbering sheets, foliation and pagination, are rarely employed in Medieval Hebrew manuscripts, and only foliation was employed in a significant number of codices.

A. Signatures

Signatures are found everywhere, but almost never in Ashkenaz. Usually, signatures are designated by Hebrew letters, but in the Orient, sometimes by Arabic words or numerals — generally in addition to the Hebrew numeration — presumably for the sake of the non-Jewish binders.

Signatures are generally employed in addition to catchwords (or repeated words), but in some Oriental, Sefaradic and Italian manuscripts, particularly in early periods, they are the only technique used to preserve the correct order of the quires (see Plates 13-14).

In the Orient signatures are used in most manuscripts as early as the earliest codex (dated 1009) in which means of ensuring the order of the quires are found or preserved.

In Sefarad signatures are employed in the earliest localized dated manuscript written in Gerona in 1184, yet later they are not to be found until 1275, most of the manuscripts written in the interim bear no means of keeping the order of the codex at all. Ever since, signatures are employed rather frequently in

106 Signatures at the head of each quire are found in MS Hamburg, Staats- und Universitätsbibliothek Cod. Levy 116 (HPP 934), written in Prague in 1396 by a scribe originating from Warsaw. Signatures at the end of each quire are found also in MS Paris heb. 374, written in an Ashkenazic hand in 1342 (cf. Sirat—Beit-Arié, Manuscrits médiévaux, 1, 39). Signatures are also signed in an undated Ashkenazic manuscript in two volumes of the end of the thirteenth century (MSS Venice, Biblioteca Marciana Or. 212-213 v. 4-6).

107 Signatures in Greek letters are found in MS Jerusalem, JNUL Heb. 83941, written in Byzantium in the thirteenth century. The quires of MS Oxford Poc. 344 (Neubauer 319), copied in Tripoli (Syria) in 1385 (HPP 8341), are numbered at the head by points in the upper left corner. Numerals are not used in numbering quires. Only in one late manuscript were European numerals signed in addition to Hebrew letters — MS New York, JTS Misc. 2638 (HPP 991), written in Italy in 1507.

108 The earliest example is found in the complete quire of Maimonides' draft of his Mishne Tora preserved in the penize (MS Oxford, Bodleian Library Heb. d.32, fol. 47v), at the head of which a signature in Arabic words is written. In one of his autographic volumes of the commentary to the Mishna, MS Oxford Hunt. 117 (Neubauer 370), the head of each quire is numerated only in Arabic words written in a different ink.

109 MS Leningrad, Public Library B19a (HPP Y302), written in Cairo. Catchwords are also employed.

110 MS Hamburg, Staats- und Universitätsbibliothek Cod. Hebr. 19 (Steinachneider 165) (HPP G150). Signatures are found in the Sefaradic MS Vatican Ebr. 269, dated doubtfully 1094/5 (cf. above, note 15).
about half of the surviving parchment manuscripts. In paper manuscripts signatures are employed quite rarely.

In Italy, signatures are not found in the three earliest manuscripts (dated 1072/3, 1091, 1105/6), in which catchwords are employed, but they are employed in the fourth earliest manuscript, dated 1246/7, written probably in Rome. Since then, signatures are employed in most of the manuscripts until the end of the fourteenth century together with catchwords (or repeated words). In the fifteenth century the employment of signatures gradually declined, though until 1431 more than half of the dated manuscripts are still found to have signatures.

In Byzantium signatures are very rare.

Placements of signatures

Signatures are placed in three different ways. They can either be written in the right corner of the upper margin of the first page of each quire — except for the first quire — (see Pl. 13), or in the right corner of the lower margin of the last page of each quire — except for the last one — (see Pl. 14), or both at the beginning and at the end of each quire.

All three ways of placing were employed in the Orient, Sefarad and Italy. In Byzantium, where signatures were rarely employed, they were placed always at both beginnings and end of the quires, a practice which was also preferred in other regions.

In early Oriental manuscripts signatures were placed at the head of the quire (see Pl. 13). This practice was retained as the main numeration technique in the Orient until the middle of the fourteenth century, but a signature was also placed once at the end of a quire in a manuscript copied in 1112 and as early as 1210 signatures were placed in a few manuscripts at the end of each quire only. Double numbering of quires, both at the head and at the end are employed regularly as early as 1222 and rather frequently from the middle of the fourteenth century. Double signatures were employed side by side with signatures at the head of each quire in the second half of the fourteenth century, while from the beginning of the fifteenth century double numeration became the main practice. Only rarely were signatures placed at the end of the quire only in the Orient.

In Sefarad, the usual placing of signatures throughout the Middle Ages was at the head and at the end of each quire, as early as the earliest localized manuscript (dated 1184). In the last quarter of the thirteenth century, when signatures are again found in Sefarad manuscripts, all three placements are employed. From the end of the thirteenth century on, the commonest technique is double numeration, and only infrequently are signatures written only at the end of each quire. Signatures are very common in parchment and parchment-paper manuscripts in Sefarad, but quite rare in paper manuscripts. Generally, signatures are employed in addition to catchwords.

In Italy, where signatures were employed in addition to catchwords as early as 1246/7, mostly in parchment manuscripts, they were mainly placed both at the head and at the end of each quire, but during all periods a single numeration, especially at the end of each quire, was sometimes also practiced. Signatures were placed at the head of each quire only in a few manuscripts, mainly until the mid-fifteenth century.

B. Numeration of sheets, leaves and pages

In general, these means of numbering (by Hebrew letters) are scarcely used in the Middle Ages. Numbering the sheets of each quire, which is so common in Hebrew printed books was used very rarely by scribes. Only very few manuscripts in which such a practice is employed have been found from all areas in the

\[111\] MS Paris, Bibliothèque nationale heb. 312 (HP 876).

\[112\] The earliest employment in the surviving Byzantine manuscripts is in MS Leipzig, Karl-Marx-Universitätsbibliothek B.H.13 (HP G64), copied in Saloniki in 1329.

\[113\] In a manuscript written in Mardin (Turkish Kurdistan) in 1292 (cf. above, note 98) signatures are placed at the head of each quire in the left corner of the upper margin. In MS San Francisco, Sutro Library WPA 106 (HP D227), copied in Yemen in 1299, signatures are placed in the right upper corner or sometimes in the middle of the upper margin, both at the beginning and the end of each quire. The signatures in Arabic words (or numerals) added in Oriental manuscripts are usually placed at the head of the quire in the upper left corner.

\[114\] MS Oxford Heb. f. 18 (Neubauer-Cowley 2791) [HP C982].

\[115\] MS Oxford Poc. 99 (Neubauer 1452) [HP C211]. The beginning of the last quire is also numbered, in the lower right corner.

\[116\] MS Berlin, Staatsbibliothek Or. Qu. 568 (Steinschneider 95), written in Acre (HP G94).
fifteenth century. An exceptional earlier employment is found in a parchment-paper manuscript written in Ubeda (Spain) in 1290,\(^\text{117}\) in which the inner paper sheets alone are numbered in each quire.

Foliation was also an uncommon practice. Numbering each leaf was sometimes employed in Seferahd, Italy and Byzantium. Only in Seferahd was this practice employed in a significant number of manuscripts, mostly those written on parchment, as early as 1272.\(^\text{118}\) In Byzantium, foliation is found in some late fourteenth century manuscripts, while in Italy, leaves were only occasionally numbered in the fifteenth century, though foliation is found in one manuscript dated 1286.\(^\text{119}\)

Pagination, numbering each page of the codex, was employed very scarcely in Italy and Spain in the second half of the fifteenth century.

C. Signing the opening of the quire

In the Orient, especially in Yemen, an interesting practice of signing the opening of the inner sheet of the quire is found in quite a few manuscripts from the fourteenth century on, but it can be traced earlier, as early as the end of the twelfth century.\(^\text{120}\) The sign, basically in the shape of a Z (see Pl. 15), is written in the four corners of the opening, or in two of them — the upper right and the lower left. These signs might have been added by the binders, since in many manuscripts they are written in a different colour or nuance of ink.\(^\text{121}\)

\(^\text{117}\) MS New York, JTS Rab. 15 (HPP D1). Numbering is preserved in only two quires. Both parts of the paper sheets are numbered, verso sides in the first half of the quire and recto sides in the second half.

\(^\text{118}\) MS Paris, Bibliothèque nationale hbr. 26, written in Toledo (Sirat--Beit-Arié, Manuscrits médillieux, I, 8).

\(^\text{119}\) MS Vatican Rossiano 554 (HPP E101). The first twelve quires are numbered, while from the following quire on, the signatures are replaced by continuous foliation, written on both sides of each leaf.

\(^\text{120}\) A similar sign is marked in the lower left corner of the recto side of a single leaf found in the geniza, dated 1192 (MS Cambridge, University Library TS Arabic 48.11 [HPP C661]). In MS Berlin, Staatsbibliothek Or. Ov. 568 (Stecherlscher 95), copied in Aden in 1222, (HPP G94), similar signs are found, usually at the end of the quires, but sometimes in the central openings of the quires.

\(^\text{121}\) In an Arabic treatise on the art of binding and gliding, the author, Abū ‘Abdāl Aḥmad ibn Muḥyimmed al-Sufi, instructs the binder to note the middle of the quires by
This practice was probably also known in North Africa, and resembles a practice in Latin manuscripts, as described by N.R. Ker, "of marking the recto side of the central opening of a quire by means of a cross in the lower margin. In English manuscripts of the fourteenth century, this cross is often across the 'gutter', i.e. partly on the verso and partly on the recto, or it may not be a cross but simply a stroke across the gutter." This practice is, of course, very helpful to palaeographers when they try to reconstruct the composition of quires in damaged manuscripts.

CHAPTER FIVE
RULING TECHNIQUES

Forms and architecture of rulings will not be discussed herein, though once classified, they generally conform in each codicological entity. In general, Ashkenazic parchment manuscripts display the most sophisticated patterns. In many paper manuscripts, especially in Ashkenaz and Italy, but almost never in the Orient, only bounding lines or vertical bounding lines are drawn.

1. PRICKING

Prickings for guiding the ruling of the vertical and horizontal lines are employed in parchment manuscripts in all regions at all periods. Lack of pricks in quite a considerable amount of manuscripts is certainly due in most cases to the trimming of the margins during binding and rebinding. However, regarding a significant number of manuscripts, written in Sefard from the middle of the fourteenth century on, and in Italy from the second third of the fifteenth century on, in which no pricks can be found, we have sound reasons to assume that prickings was not indeed implemented. This should be concluded from their ruling techniques, which are confined to each leaf or page, or two leaves together, and not to each sheet. Surely, if prickings had been employed in such ruling, it should have been implemented in both the outer and inner margins. Its absence in the inner margins proves that in these manuscripts prickings was not employed at all.

In paper manuscripts prickings are hardly ever found. Sometimes pricks are found in paper manuscripts for guiding the ruling of the bounding lines alone, particularly in Ashkenaz and Italy. The almost total lack of guiding pricks in paper manuscripts cannot always be ascribed to binding and rebinding. No doubt, most paper manuscripts were ruled without guiding pricks, but, like those parchment manuscripts, by some kind of other unknown guiding technique, perhaps by some ruling-board, which was employed in the Orient (see below).

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122 It is found in MS Paris hib. 340 (IHP 867), written in 1335, probably in North Africa. Similar signs are found in some Oriental and North African Arabic manuscripts kept in the Yahuda Collection of the Jewish National and University Library in Jerusalem.

123 Quoted from his letter to me, dated 8th November 1970.

124 An early example is MS Jerusalem, JNUL Heb. 4°577/4.50, a fragment of three paper sheets from the Cairo Geniza. Each folded sheet was pricked separately in the outer margin.
Pricking for guiding the ruling of the horizontal lines may be implemented either in the outer margins only or in both the outer and the inner margins. These two methods were usually conditioned by the ruling technique chosen. Ruling each sheet or group of sheets requires guiding pricks in both edges of the unfolded sheet, while ruling each leaf or page, or group of leaves, requires guiding pricks in both edges of the leaf or the page.

In the Orient, Italy and Byzantium, pricking was always confined to the outer margin alone, while in Sefarad and Ashkenaz pricking in both outer and inner margins was also employed.

In Sefarad, outer and inner pricking was the usual technique employed from the earliest localized Spanish manuscript up to the end of the Middle Ages, and until 1284 this was the only way of pricking. In the same year one finds the earliest Sefaradic manuscript whose quires are pricked only in the outer margins. Ever since, pricking the outer margins alone is employed in a considerable number of parchment manuscripts, but the old practice of pricking both margins is still in much greater use.

In Ashkenaz one notices a distinctive shift of practices. In the early Ashkenazic manuscripts only the outer margins were pricked, but the shift in techniques of parchment making (see above, chapter 2) and ruling instruments (from hard point to lead pencil – see below) in the middle of the thirteenth century also involved a transition of the pricking placement, from the outer margins to both outer and inner margins.

The earliest Ashkenazic manuscript in which all the quires were pricked in both margins is dated 1264. However, the beginning of this new practice can be seen a little earlier, in quires written by one of the scribes of a manuscript copied in 1233, and in one sheet in a manuscript written in 1254. Up to the end of the thirteenth century both placements of guiding pricks were employed, but from the beginning of the fourteenth century on, the Ashkenazic manuscripts share the common practice of pricking both margins, and only very rarely can pricks be found in the outer margins alone.

Only in Ashkenaz, as early as the time of the earliest manuscript, dated 1177, are double pricks for special lines found. The ruling of one to three upper, middle and lower horizontal lines is frequently guided by two close pricks in both sides of the unfolded sheet or the leaf instead of by single pricks. These lines were usually drawn right across the width of the sheet or the page, from pricks to pricks.

Most of the Hebrew manuscripts were pricked quire by quire, the sheets being folded before pricking. Only rarely were other techniques applied, such as pricking sheet by sheet (folded or unfolded), but never the sophisticated techniques found by Rand and Jones in Latin manuscripts of the early Middle Ages.

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129 MS New York, General Theological Seminary, Bible/O.T. Hebrew MS 1294 (HPP D180).
130 MS Munich, Bayerische Staatsbibliothek Cod. Hebr. 5 (HPP G2).
131 MS London, British Library Harley 5648 (Margoliouth 518) [HPP C356], fol. 106-107.
132 A similar shift of pricking techniques in English manuscripts written after the Norman conquest was noticed by N.R. Ker, English manuscripts in the century after the Norman conquest, Oxford 1960, p. 43. L.W. Jones, 'Where are the pricks?', TAPA, LXXV (1944), p. 78, referring to a single manuscript written in Ireland in the end of the sixth century, in which pricks are placed in both margins, remarks that this system "becomes the exclusive property of Insular scribes". Such pricks found in Continental manuscripts are ascribed by Jones to Insular influence (ibid., pp. 80-82).
133 About a similar practice in English manuscripts see Ker, op. cit., pp. 42-43.
134 See the references given by L.W. Jones, 'Ancient pricking in eight-century manuscripts', Scriptorium, XV (1961), pp. 14-22. An exceptional technique was employed in an undated gliczes fragment, MS Jerusalem, JNUL 4577/5:B: only the first sheet of each two successive sheets was pricked, while both sheets were ruled together. Such a pricking and ruling technique was found in Latin manuscripts of the beginning of the ninth century by E.K. Rand, 'Pricking in manuscripts of Orleans', TAPA, LXX (1939), p. 334. The
The rows of the guiding pricks are always in the margins, quite far from the written lines, but in some late paper manuscripts pricks guiding the ruling of the bounding lines are found in the corners of the written space.

In a few manuscripts, written mainly in Ashkenaz, vertical lines for guiding the rows of the pricks are ruled.

2. RULING TECHNIQUES

Ruling techniques vary according to the instruments employed, the ruling unit and the side of the sheet or the leaf ruled. The instruments employed by Hebrew Medieval scribes were a hard point, a lead pencil, pen and ink and a ruling-board. Hard point was the oldest instrument, commonly used in all areas for ruling parchment manuscripts, while pen (with ink) was the latest one.

Ruling with a lead pencil, which was already introduced in Latin manuscripts in the eleventh century, and in Oriental Syriac manuscripts apparently earlier, was introduced in Hebrew European manuscripts about two centuries later, first in Ashkenaz, where eventually it replaced completely ruling with a hard point, and later also in Italy and Sephard, where it was used only occasionally.

The long delay in adopting the new instrument was undoubtedly due to Jewish Halakhic considerations, which are indeed reflected in the Halakhic literature of the twelfth century and later times. Since, according to the Jewish law, the Pentateuch Scroll — the ritual Sifrei Tora — has to be ruled, the introduction of pencil as a ruling instrument in European civilization raised the question whether such a ruling might be implemented in the ritual scrolls. This possibility was rejected by French, German and Provençal Rabbis. Consequently, the pencil was also avoided by scribes when ruling non-ritual codices and only during the thirteenth century, was the pencil gradually adopted.

Ruling can be applied to each single sheet (folded or unfolded), to each single leaf or to each page, but also to a group of sheets or leaves together.

Ruling can be carried out either on the hair-side or the flesh-side of parchment sheets or leaves, and either on the recto side or the verso side of parchment or paper leaves.

In parchment manuscripts various ruling techniques were employed, while in paper manuscripts the variety of techniques which were practised is much smaller.

sometimes ruling with a hard point resembles ruling with pencil when dust is accumulated in the furrows impressed by the hard point.

136 Cf. the reactions of Rabbi Isaac ben Samuel (twelfth century) cited by Rabbi Baruhk ben Isaac of Worms, Sifrei haTannaim, Warsaw 1897, paragraph 196, fol. 6b; Rabbi Simha (and of the twelfth century), cited by Rabbi Isaac ben Moses of Vienna, Or Zara, I, 1802, paragraph 54; Rabbi Meir ben Solomon Meiri, Diryot Sifrei, ed. M. Hirschler, Jerusalem 1967, p. 30 and the sources referred to by the editor; Rabbi Abraham ben Nathan Yabi, Hamehemimp, Jerusalem 1961, p. 168, who cites also the rejection of ruling with ink in Halakot G'Molot; Rabbi Yom Tov Lipman Woman, Tibbon Sifrei Tora, edited by D.S. Lifshinger and E. Kupfer, Sinai, LX (1967), pp. 266-267. I am indebted to Mr. Kupfer for informing me about the first two references.

140 The Halakhic law of ruling ritual Scrolls affected also secular writing and even letter writing, since Biblical phrases naturally occurred in all kinds of texts. Cf. Babylonian Talmud, Gitin 6b, and the discussion of the Tosafot on that problem. See also Maimonides, Mishne Tora, Hilgol Sifrei Tora 7:16 and other sources quoted in the commentaries Keesef Midbar and Haggagit Maymoniyot.
A. Ruling with a hard point

1. Ruling each sheet of parchment on the hair-side with a hard point

Such a ruling technique was exercised before folding and arranging the sheets in the quire. Quires which were ruled in this manner were pricked in the outer margin only. After ruling, sheets were placed in accordance with Gregory's Rule, so that each opening of the codex shows either the furrows made by the hard point facing furrows, or ridges facing ridges.

This is the main technique of ruling parchment manuscripts throughout the Middle Ages in Italy, and the only practice employed by Italian scribes until about 1280.

In Ashkenaz it was the sole technique until the mid thirteenth century, when it was replaced gradually by the new technique of pricking both margins and ruling with a pencil. About 1300 the shift of ruling techniques in Ashkenaz was completed, and ruling with a hard point is not to be found anymore. During the transition period of the second half of the thirteenth century, ruling each sheet with a hard point was also implemented in parchment with sides that were completely alike, while the sheets were arranged so that the furrows of the ruling faced furrows and ridges faced ridges.

Ruling each sheet with a hard point on its hair-side (or each leaf on its hair-side) was introduced to Sefarad at the end of the thirteenth century, and was gradually adopted by many scribes, mainly from the middle of the fourteenth century on.

2. Ruling each sheet of parchment on the flesh-side with a hard point

This ruling technique was used exclusively in the Orient in most parchment manuscripts throughout the Middle Ages. With the exception of Yemen, all the existing Oriental dated parchment manuscripts are of early periods, therefore it is unknown whether this practice was retained after the thirteenth century. However, in Yemen, where parchment codices were produced until the end of the

Middle Ages, and preserved to this day, this ruling technique was always employed.

3. Ruling each pair of successive parchment leaves (or sheets) at a time, on the hair-side, with a hard point

Such a ruling technique is applied after the quires have been assembled and arranged. The ruling follows the order of the quire; it is always exercised on the hair-side, and the impressions of the hard point can also be seen on the following or preceding leaf (or sheet), i.e., the flesh-side. When this method is implemented on each pair of single leaves, both outer and inner margins are pricked. When it is applied to each pair of unfolded sheets, only the outer margins are pricked.

This particular technique is found exclusively in Sefarad as early as the earliest dated manuscripts. It was practiced by Sefaradic scribes until the end of the Middle Ages, but while it was the commonest practice of ruling parchment manuscripts up to the middle of the fourteenth century, it was only occasionally employed thereafter. Until about 1282 all the Sefaradic manuscripts ruled according to this method were pricked in both margins and ruled while the quire was folded, each pair of leaves together, usually following the order of the quire. Later on, particularly at the end of the thirteenth century, the same

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142 The same ruling practice is found in the Samaritan Biblical codices kept in the Samaritan Synagogues in Nablus.

143 Such a technique can already be observed in a geniza fragment, written by a scribe originating from Lybia in 1123 (cf. above, note 10). Outside Sefarad, a similar technique is found in MS London, British Library Or. 6712 (HPP C366), written in Italy in 1287-1288; only the bounding lines were ruled in each pair of successive leaves on the hair-side.

144 Since the quires of almost all the Sefaradic manuscripts start with the hair-side, ruling by such a technique naturally follows the order of the quire, and is exercised on each recto hair-side. In MS Oxford, Bodleian Library Arch. Seld. A47 (Neubauer 1), copied in Soria in 1304 (HPP C11), each quire (of 6 sheets) starts with the flesh-side; the technique of ruling two leaves at a time was employed in each quire in the following manner: fol. 2r (hair-side) > 3, 4r > 5, 6r > 7, 8r > 9, 10r > 11. The outer sheet of each quire (fol. 1/12) was ruled while it was folded in reverse, i.e., 12r (hair-side) > 1, and then refolded and replaced. A similar method is found in MS Paris, Bibliotheque nationale hsb. 20, written in Tudela in 1300, whose quires of 4 sheets also start with the flesh-side (cf. Sirat--Beit-Ari, Manuscrits mhrkhawaux, 1, 265). In some manuscripts the practice of ruling pairs of successive leaves on the hair-side is not confined to the recto pages of the hair-side, but might be also exercised on the verso pages backwards, e.g., 3r > 2, 4r > 3 etc.
method was sometimes also implemented in quires pricked in the outer margins alone, while each pair of unfolded successive sheets are ruled together.

Since the impressions of the ruling were not always clearly visible on the second leaf or sheet, especially on the fourth page or side, Sefaradic scribes used to repeat quite frequently the ruling of the pairs of leaves or sheets on the fourth page (or side), which was always a hair-side, thus some of the pairs of leaves or sheets are twice ruled on both hair-sides. Sometimes scribes employed a lead pencil to rerule unclear vertical or horizontal lines in the fourth or in the third page of the pair of leaves.

4. Ruling leaf by leaf with a hard point

This is the usual technique of ruling paper manuscripts in all areas apart from the Orient. Ruling is exercised either on the verso sides or on the recto sides, but generally on the verso sides. In parchment manuscripts such a practice was employed quite frequently in Byzantium and in Sefarad from the middle of the fourteenth century on.

5. Ruling parchment leaves on both sides

This exceptional technique, by which each page is ruled, i.e. each leaf is ruled twice, can be found in a few parchment manuscripts written in Toledo (Spain) in the second half of the thirteenth century.\footnote{The usual Medieval pencil was composed of three quarters lead and one quarter bronze, according to S. Solonon, Paléographie du Moyen Age, Paris 1973, p. 159.}

B. Ruling with a lead pencil

The introduction of this new instrument of ruling involved a revolutionary change in ruling frequency. By using a hard point for ruling, one could economize by ruling several leaves or sheets at one time, or by ruling each leaf or sheet on only one of its sides. Employing a pencil instead of a hard point not only prevents the saving of time by ruling several leaves or sheets together, but requires ruling of both sides of each leaf or sheet. However, in some parchment manuscripts written in Ashkenaz, Spain and particularly Italy, one notices that a certain kind of hard and sharp pencil presumably of different composition,\footnote{Such a pencil was already used as an additional ruling instrument in MS London, British Library Ar., Or. 51 (Morgoliouath 951), copied in Ashkenaz in 1189 (HPP C351). On some sheets of this manuscript vertical bounding lines for the most part are ruled with a sharp pencil, mainly on the other sides (flash-sides) of the sheets, which are ruled with a hard point.} was used\footnote{Cf. above, note 146. At the beginning pencil was employed merely as an additional means to reinforce vertical or horizontal lines on the other sides of sheets ruled with a hard point. Such is the nature of the partial employment of pencil in MS Milano, Biblioteca Ambrosiana B. 30 inf. (Bernheimer 2), written in Germany in 236 (HPP E40). One of the scribes of MS London Harley 9848 (Morgoliouath 984), dated 1254 (HPP C356), employed a pencil for reruling the vertical lines of the other side of the sheets ruled with a hard point (the parchment used in this manuscript shows no distinction between its two sides), and one of his sheets, which was exceptionally pricked in both margins, was ruled completely with a pencil, page by page. In MSS Oxford, Bodleian Library Mich. 617, 627 (Neubauer 1033, 1035), written in Germany in 1258 (HPP C147), which were pricked and ruled according to the old techniques (pricking the outer margins and ruling each sheet on the hair-side), a pencil was employed regularly for reruling the flash-sides. In MSS Munich, Bayerische Staatsbibliothek Cod. Hebr. 5 (HPP G2), dated 1233 and Cambridge, St. John's College A3 (HPP C668), dated 1239, pencil was used merely for special rulings for decorations.} in the same manner as a hard point. Such a pencil was employed only on one side of the leaf or the sheet, but due to its metallic hardness, the ridges of its ruling lines are visible on the other side as if ruling was made by a hard point.

The regular employment of pencil was in ruling page by page, or, sometimes, each sheet on both its sides. Ruling each page with pencil is the only technique of ruling parchment manuscripts in Ashkenaz from the beginning of the fourteenth century up to the end of the Middle Ages, and also the commonest technique employed in Ashkenazic manuscripts of the second half of the thirteenth century. Although partial or an additional employment of pencil are to be found in Ashkenazic manuscripts as early as 1189,\footnote{As a sole way of ruling such a technique was employed in two manuscripts: MS Cambridge, Harvard College Library Heb. 36 (HPP D172), dated 1200, and MS Parma, Biblioteca Palatina 2970 (De-Rossi 765), dated 1298 (HPP E439), which is unlocalized, but its 3 sheets quicks indicate that it should have been copied in Toledo (cf. above, note 72). In two other manuscripts written in Toledo, ruling page by page is applied only partly, while the basic technique employed is that of ruling successive pairs of leaves at one time, frequently twice, on the hair-side of the first page and on the fourth page; the reruling of the flash-side occurs only on the first flash-side page of each pair of leaves (the verso of the first leaf): MS Parma 2025 (De-Rossi 1113), dated 1296 (HPP E411) and 2068 (De-Rossi 782), dated 1276/7, in which a small part is also ruled page by page.} the earliest manuscript which is ruled entirely with a pencil, page by page, is dated 1264.\footnote{MS New York, General Theological Seminary (cf. above, note 129) which is also the}
Apart from Ashkenaz, pencil was employed as a ruling instrument in Sepharad and Italy, but only occasionally, mainly in the last quarter of the thirteenth century and the beginning of the fourteenth century.\(^{100}\)

C. Ruling with pen-and-ink, page and page

In most manuscripts in which ink was employed for ruling, only the horizontal lines were drawn with a pen, while the vertical bounding lines ruled with pencil, or, very rarely, with a hard point.

This is a local ruling practice employed only in Italy, almost exclusively in North Italy (Emilia-Romagna and Lombardy), from about 1435\(^{113}\) on. This particular kind of ruling was practiced on parchment as well as paper manuscripts.

D. Ruling paper leaves with a ruling-board (“Maṣṭara”)

A particular technique of ruling paper manuscripts can be observed in most of the Oriental paper manuscripts. When one examines the Oriental paper manuscripts, one does not usually notice the straight, thin and deep furrows which are characteristic of the Western ruling with a hard point. Instead one finds wide, flat and quite curved furrows, usually on the verso side of each leaf. In addition, the ruling always has a strict uniform disposition, or several uniform dispositions along the manuscript, and at times shapes of cords impressed in the paper can be seen (see Pl. 16). These characteristics lead us to look for some “mechanical” device as a ruling instrument.

Such a device, a ruling-board, was indeed employed in the Orient. Jewish scribes in Yemen in recent generations were witnessed ruling paper manuscripts with a ruling-board, called in Arabic Maṣṭara, made of wood. Cords were

\(^{100}\) Traces of employing a pencil for ruling vertical lines can already be seen in an Italian manuscript dated 1253 (MS Paris, Bibliothèque nationale heb. 163 [HPP B332]).

\(^{113}\) This is the date of the earliest manuscript found to be entirely ruled by this technique, MS Vatican, Rossiano 555 (HPP E178), written in Mantua. However, two quires in MS Paris heb. 612 (HPP B292), copied also in Mantua in 1421, were already ruled in this manner.

Pl. 16 Impression of the cords in paper ruled with a ruling-board.
Jerusalem, 1388
MS New York, JTS Rab. 1118, fol. 137v
threaded into grooves, forming ridges corresponding to the horizontal and the vertical bounding lines. The scribe placed each leaf of the manuscript on the board and rubbed it with the thumb along the covered threads, which consequently left their impressions on the leaf. A specimen of such a ruling-board was indeed brought from South Arabia by the German geographers K. Rathiens and H. Wiesmann at the end of the last century, and it is now kept in the Israel Museum in Jerusalem (see Pl. 17). Strange enough, the same kind of ruling-board is still used in the Western Siberian scriptoria of the Old Believers. Samaritan scribes in Nablus use a similar device, made of cardboard, to this very day (see Pl. 18). That such a board was made of cardboard was also attested to by a French Orientalist in 1803, while describing the ruling technique of Arabic calligraphers.

That such a device was employed by Jewish Oriental scribes in the Middle Ages is proved by a student’s model of such a board, fortunately preserved in the Cairo geniza and kept now in the Cambridge University Library among the geniza fragments (see Pl. 19). This model board was made by gluing together used leaves of paper with Coptic writing. The threads, pulled into two rows of grooves, were glued to the surface of the board. On the other side the board was labeled a practise “Maṣṣara,” the Arabic name for this device, a term mentioned already by Maimonides and by Arabic sources, which should be interpreted accordingly.

153 Cf. N.N. Pokrovskiǐ, “Western Siberian scriptoria and binderies; ancient traditions among the Old Believers” (translated from Russian by J. S. C. Simonds), The Book Collector, XX (Spring 1971), pp. 20-21 and plate 1, in which two boards of this kind are reproduced.
155 TS K11154, Dr. Y. Sussmann drew my attention to this remarkable board.
156 In his Arabic commentary to the Mishna, Kelim 12:8 (ed. J.N. Demenberg, Berlin 1887), as a translation of the Hebrew word kanina mentioned in the Mishna. Cf. also the Geonic commentary to Sefer ŢHaarot, attributed to Rav Hai Gaon (ed. J.N. Epstein 1921) p. 27 and other references quoted by Epstein, which may reflect the employment of such a ruling-board in the early Middle Ages.
157 Such as the old anonymous treatise on calligraphy cited by D.S. Rice, The unique Ibn al-Dawwāb manuscript in the Chester Beatty Library, Dublin 1955, p. 7.
Pl. 18  A ruling-board employed by contemporary Samaritan scribes in Nablus

Pl. 19  A student’s model of “Maṣṭara” preserved in the Cairo geniza
MS Cambridge, University Library TS K.11.54
3. GEO-CULTURAL CLASSIFICATION OF RULING PRACTICES

Ashkenaz

Parchment manuscripts:

1. Until about 1260, prickings the outer margins and ruling sheet by sheet before folding, on its hair-side with a hard point. Pencil is employed occasionally for reruling. Sheets of manuscripts made of parchment by the new technique of equalizing both sides are ruled on one side and arranged in the quire so that furrows face furrows and ridges face ridges on each opening.

2. From about 1300 on, prickings both outer and inner margins and ruling with pencil, page by page.

3. In the last four decades of the thirteenth century, both techniques, old and new, were used simultaneously, the old technique being ejected by the new one. During this transition period, mixed techniques are employed in some manuscripts.

Sefarad

Parchment manuscripts:

Prickings in the outer and the inner margins in all the manuscripts copied up to 1282, and in many manuscripts copied thereafter. A considerable number of manuscripts from the late fourteenth century on might not have been pricked at all. The most usual ruling technique employed until the middle of the fourteenth century is ruling with a hard point each pair of successive leaves (or, from 1284 on, particularly at the end of the thirteenth century, each pair of sheets) at one time on the hair-side, while sometimes reruling, occasionally with a pencil, is employed, especially in the fourth page of each pair of leaves. From the middle of the fourteenth century on, ruling each leaf with a hard point either on the recto or the verso side is quite frequent, as well as ruling each sheet or leaf on its hair-side (already employed at the end of the thirteenth century). In some manuscripts produced in Toledo in the second half of the thirteenth century each page was ruled with a hard point. A few manuscripts, particularly from the last quarter of the thirteenth century, are ruled with a pencil, page by page.

Paper manuscripts are ruled with a hard point, leaf by leaf, usually on the verso side. Prickings are not applied in ruling paper manuscripts.

4. In many manuscripts of all periods double guiding pricks are found for special horizontal lines.

5. Usually an additional horizontal line is ruled, and the letters are written between two ruled lines.

Paper manuscripts are ruled with a hard point, or sometimes with a pencil. Usually only bounding lines or merely vertical bounding lines are ruled. Prickings are applied only for guiding the bounding lines.

158 In Germany the shift of prickings and ruling techniques followed the change in parchment production (cf. above, chapter 2). So far, the earliest manuscript found to be entirely pricked and ruled by the new technique is dated 1264 (cf. above, note 129). On earlier partial prickings of both margins and ruling with a pencil see above.

159 Such as employing prickings only in the outer margin while ruling both sides of the sheets with a pencil in MS Oxford, Bodleian Library Marshall (Or.) 24 (Neubauer 151), written in 1291 (HPP C26). Some manuscripts of this period are partly pricked and ruled according to the old practice and partly according to the new one, like MS Parma, Biblioteca Palatina 3091 (De Rossi 380), written in 1296 (HPP 428), in which most of the quires are pricked and ruled by the old technique, but five of them (fols. 227-269) are pricked in both margins and ruled with a pencil, page by page. A remarkable example, which reflects the intermixture of the old and the new techniques of parchment making, prickings and ruling, is MS Parma 2024 (De Rossi 60), copied in France in 1279 (HPP E421). The entire manuscript is pricked in the outer margins, but one quire (fols. 135-142) is pricked in both margins. Part of its quires (fols. 1-134, 176-180) are written on parchment whose sides are alike. In these quires both instruments were used for ruling: some quires are ruled sheet by sheet with a hard point, ruled sides generally facing ruled sides (fols. 1-24, 44-75, 175-180); some are ruled with pencil, sheet by sheet on both sides (fols. 25-43, 76-134). Part of the quires are written on parchment manufactured according to the old technique of preserving the difference between the two sides (fols. 135-174, 181-217). Most of these quires are ruled with a hard point, sheet by sheet (the only quire pricked in both sides is ruled leaf by leaf) on the hair-side. Pencil is used occasionally for reruling flesh-sides, but one complete quire (foll. 197-204) is ruled entirely with a pencil, sheet by sheet on both sides.