Twenty years ago I attempted in my Hebrew Codicology, firstly to present morphological types of Oriental Arabic paper used in dated medieval Hebrew manuscripts, and secondly to characterise their patterns chronologically and regionally. In the interim I was able both to enlist the assistance of SFARDATA, our comprehensive codicological database of Hebrew dated manuscripts, and to draw upon the evidence of more manuscripts among the many dated codices recorded and studied by the Hebrew Palaeography Project. I have benefited in particular from the Russian manuscript collections which have recently become accessible. In the National Library of St Petersburg alone, over 140 additional dated codices (about a quarter of them dating before 1300), written in Hebrew characters and produced in the Near East on Arabic paper, have been documented. They provide clearer information on the visible morphology of the paper. In addition, I have examined in the Bodleian Library in Oxford 140 Oriental dated manuscripts written on Arabic paper. Most of these are written in Arabic script, but some are written in Persian and a few in Syriac script. All of them come originally from the Near East. The usually excellent physical condition of the Bodleian Arabic and Persian codices enhances their contribution to the study of Arabic paper morphology.

Having recorded some 620 dated manuscripts (and an additional 110 undated but named ones, many of them datable) produced in the Near East on Arabic paper, it is possible now, not only to modify and extend the previous typology, but also to substantiate its basic structure and main characterisation. Indeed, these remain valid or are even reinforced. Nevertheless, one should bear mind the frequent difficulty in identifying the visible structure of the Arabic paper even in well-preserved manuscripts, the many cases of ambiguous documentation and the inconsistent or contradictory impressions which blur clear and distinctive description. Surely, only systematic reproduction of the wire pattern of a large number of folios (or, when it is feasible, unfolded bifolia) from the dated witnesses, for instance by the beta-radiography technique, may provide us with a clearer typology. Regular small-size beta-radiography reproductions have usually been found to supply insufficient information, because of the irregularity of the Arabic paper. Above all, a systematic study of dated and localised Arabic manuscripts is essential for the establishing of a more secure typology of the patterns of Oriental Arabic paper, their emergence, distribution, and duration.

The earliest paper manuscript examined is apparently the earliest known (dated) Arabic paper manuscript, dated 848, which I found by sheer accident in the Regional Library of Alexandria. The only other pre-1000 manuscript examined is dated 983 (Ms Oxford, Bodl. Hunt. 228). The earliest surviving dated Hebrew...
paper manuscript are dated 1005 (a fragment, Ms Cambridge, UL TS 8 Ca.1), and 1006 (a codex, Ms St. Petersburg, NL EBP.-AP. 14520) respectively.

The following seven types, mostly in accordance with those proposed by J. Irigoin and his colleagues, can be discerned, outlined and characterised both chronologically and, to some extent, regionally.

A. **WIRE-LESS PAPER**

Its occurrence in the earliest dated manuscript (Ms Alexandria of 848) may very well indicate that early Arabic paper was wire-less or pattern-less. This kind of paper, in which no laid or chain lines are visible, was used constantly from the beginning of the eleventh century until the end of Middle Ages. It is found in a considerable number of manuscripts from all over the Near East, but occurs much more frequently in manuscripts from Iraq and Iran, where it can be found in some 18% of the recorded manuscripts.

A special type of wire-less paper showing some “chaotic” patterns and conspicuous fibres was used extensively and exclusively in Yemen from the beginning of the fourteenth century until the introduction of Italian watermarked paper around the middle of the sixteenth century. This peculiar type, found in almost 80% of the 110 dated manuscripts produced in Yemen, was most probably manufactured in that region, as it is not to be found in any other Oriental manuscript. Indeed, the only recorded Arabic codex written in Yemen contains a similar type of paper.

B. **LAID LINES ONLY**

An early type, whose first appearance in our studied corpus is dated 983. Like the previous type, however, it was produced continuously and used extensively until 1500. It was the dominating type until 1250, but declined thereafter, presumably because of the competition presented by the newly emergent types of clustered chain lines. Nevertheless, the laid-lines-only type still constituted 35% of the dated paper manuscripts in the second half of the thirteenth century, and about 23% in the following century.

The laid-lines-only type was used everywhere, but, like the wire-less type, many of its manuscripts were produced in the eastern part of the Near East, namely, in Iraq, Iran and central Asia. There the laid-lines-only type of paper was the main type from the eleventh century onwards, and comprises an average of about 70% of the dated manuscripts. Lack of chain lines characterises, therefore, paper produced in those northern-eastern areas. The production of both wire-less and, particularly, laid-lines-only paper is still attested there in the sixteenth century. The limited use of various types of chain-lines paper in those areas may indicate that this kind of Arabic paper was not produced there, but was imported from neighbouring (western) areas.

C. **LAID AND CHAIN LINES**

In many cases the visible pattern of the chain lines is not clear enough, being seemingly irregular or presenting combinations of more than one type.

1. **Single Chain Lines.**

Visible chain lines in Oriental Arabic paper are usually clustered in several uneven groupings (see below). Paper manuscripts showing single chain lines are extremely rare, comprising about 3% of our corpus. This type was found in dated manuscripts from the beginning of the twelfth until the late fifteenth century. Single chain lines are usually curved and not evenly distanced. In most clear cases their distribution is very dense; that is they are 12-25 mm apart. Two cases showing wider spaced single chain lines (36-40 mm), might represent paper produced in North Africa, as do perhaps all the rare occurrences of single chain lines.

2. **Clustered Chain Lines.**

This multi-pattern kind emerged clearly at the beginning of the twelfth century, perhaps a little earlier. Gradually its use increased, until it was as common as the laid-lines-only paper in the second half of the thirteenth century, and ultimately became the dominant kind from the first half of the following century. This kind of paper is hardly ever found in manuscripts from Iraq, Iran, and Central Asia, and it has never been found in manuscripts from Yemen after the beginning of the fourteenth century. Everything indicates that it was produced and/or used in the western parts of the Near East, that is, Syria, Palestine, and Egypt.

   a) **Chain Lines Grouped in Twos.** — It is the earliest recorded type of the clustered kind of Oriental Arabic paper. It is first clearly attested in our corpus in a manuscript dated 1119/20. The peak of its use, according to our corpus, seems to have been in the second half of the fourteenth century.

   b) **Chain Lines Grouped in Threes.** — This type apparently emerged in the early thirteenth century, though the earliest clear example is not found before 1249. Its extensive diffusion, however, came much later: it dominated other types used in the western Middle East in the fifteenth and the first half of the sixteenth century (when it remained the only kind of chained paper).

   c) **Chain Lines Grouped in Twos and Threes Alternately.** — This pattern, the latest of all, is attested for the first time by our corpus in an Arabic manuscript dated 1338. The late Don Baker, however, noticed it in an earlier Arabic manuscript dating from 1304 (The Paper Conservator, 15, 1991, p. 31). Not until the second half of the fourteenth century did it come to dominate all other types of paper used in the western regions.
12 — GAZETTE DU LIVRE MÉDIÉVAL

d) Chain Lines Grouped in Fours. — This unusual pattern has so far been tentatively identified in two Hebrew manuscripts dating from 1331/2 and 1452, but it is clear only in one Arabic codex, dated 1210. Such scarcity may indicate that such a type was produced on a very limited, possibly local scale, or that it has not been correctly categorized.

Finally, let me add a note concerning the peculiar feature of the split edges of Oriental Arabic paper sheets. This phenomenon still lacks a precise explanation. It is frequently observed in recently recorded dated manuscripts, both the Arabic ones of the Bodleian Library, and the Hebrew codices of St. Petersburg. Among the latter, which were studied more thoroughly, 40% were found with split edges, or rather splittable edges. In some cases the edges, mainly external corners, were split into 3 layers.

This phenomenon can be seen in manuscripts from as early as the eleventh century until the end of the Middle Ages. It would appear that it is not a characteristic of wire-less paper at all, nor of the peculiar Yemenite type, which may contradict scholarly suggestions (backed by medieval literary sources) that such paper was manufactured by pasting two sheets together. In solving the puzzle of the splitting, or splittable, Oriental Arabic paper, however, one should pay attention to the fact that a similar phenomenon is also observed in a few Hebrew manuscripts written in early twelfth-century Spain, and in thirteenth-century Italy and Byzantium. Thus, this feature should be studied in relation to the Occidental Arabic (Spanish) paper and the pre-watermarked Italian paper.

M. B.-A.