The splendid catalogue by F. Déroche [1], where photographic illustrations are given with a scale, makes it possible to apply the materials published there for the study of a never considered before phenomenon of the Arab manuscript culture. We mean the type of artistic design of a manuscript page which is represented in this catalogue on eleven illustrations (I, IV A, V B, VI B and C, VII B, XXIV B, XXVI B, XXVII A, XXVIII B and XXIX B) reproducing pages of ten manuscripts of the Bibliothèque Nationale de Paris: Arabe 418, Arabe 5841, Arabe 501, Arabe 427, Arabe 400, Smith-Lesouëf 206, Arabe 5816, Smith-Lesouëf 28, Smith-Lesouëf 25, Arabe 426.

The ornamental type presenting the subject of this article has striking and easily remembered compositional and decorative features. Its compositional background is formed by a vertical rectangular frame with a square dominating the centre. The space above and below the square is filled by symmetrically arranged rectangles of equal size. The decorative peculiarity of this type consists in the presence of ornamental lines projecting, like a fringe, to the margins of manuscript pages along the perimeter of decorated space.

This very fringe offers grounds to make its available samples into a separate type of decorative design. There is all reason to think that it is directly connected with the constructive principles of the main decoration and therefore may be useful for its understanding.

1. Illustration I in the catalogue by Déroche represents folio 3a of the Qur'an manuscript dating (on the evidence of a waqf-statement) not later than 1003/1594 and originating, according to Déroche, from Iran [2]. Its decorative design, if to omit all details and to consider only its principal structure, consists of the main frame with three geometric figures (a square between two equal rectangles) arranged within it, and the bordering frame with fringe-like lines projecting to the margins along its whole perimeter (see fig. 1).

The arrangement of figures within the main frame is interesting in itself. The frame presents a rectangle set vertically, its sides correlating proportionally as 9:5. This proportion is maintained with much precision. A regular square in the middle of the rectangle forms two equal rectangles above and below. Their width, as well as the width of the square, corresponds to the width of the main frame, their height turns to be equal to the diameter of a circle forming a large flower-shaped rosette (octofoil) within the square — one more decorative element. The enumerated features are enough to admit that the decorative pattern considered here has been created deliberately, according to some plan.

The triptych "square between two rectangles" presents a very common pattern of filling the main frames of manuscript ornamental decorations. Its existing variants are so numerous that a special work should be dedicated to their classification. Some of these variants are present in the manuscripts described by Déroche; they are reproduced in a supplement to his catalogue.

Let us return to the first manuscript (Catalogue, No. 535). The deliberate setting of geometric figures revealed in its decorative design obviously demanded certain calculations. The artist, who created it, should have used some measures of length. Our conjecture is: could the length of the sections between the lines of the "fringe" be the measure applied in this case?

Our guess has been confirmed — at least this time. It turned out that one half of such a section is equal to one sha'irah of the so-called "Indian cubit" which is equal, according to W. Hinz [3], to 91 cm. This measure of length discovered in the "fringe" we applied to the frontispiece, in order to find out that it fits well. In the concordance table given below we compare the measurements of the geometric figures forming the frontispiece expressed in a triple way: a) in parts of the "Indian cubit", b) in millimeters, c) according to the scale of the photograph in the catalogue by Déroche (also in millimeters).

<table>
<thead>
<tr>
<th></th>
<th>54 × 34 sha'irahs</th>
<th>341.2 × 214.8 mm</th>
<th>192 × 120.8 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>external frame</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>internal frame</td>
<td>45 × 25 sha'irahs</td>
<td>284.3 × 157.9 mm</td>
<td>160 × 88.9 mm</td>
</tr>
</tbody>
</table>
These measurements are especially persuasive for the main (internal) frame. They confirm that the correlation of its sides (9:5) is not a matter of chance: their absolute measurements (284.3 x 157.9 mm), translated into historical length units, appear as whole numbers (45 x 25 sha'irahs). It confirms that the format was selected consciously. The size of figures set within the frame and forming the composition of the frontispiece is also expressed in whole numbers (historical measures of length). The reader can take a ruler and a calculator and divide the space of a rectangle 46 x 32 sha'irahs (placed within the frame, between the axes of two cartouches) into four equal parts. The distance between the lines is equal to 11.5 sha'irahs. The halves of the upper and the lower parts are used to build up two figures (of the three obligatory for this type) — two rectangles by the sides of a square. As for the third figure — a square — there is some space left for it within the frame, a rectangle 36 x 32 sha'irahs [6], remarkable for the presence of two squares which the artist managed to arrange there in a special way. These can be noticed when the observer's sight is moving from the upper line of the text to the lower and back.

The main frame considered above is encircled by a row of bordering frames, some of them narrow, some wide. The units employed when constructing the main frame are most probably used here also. It is a difficult task, however, to trace them measuring each frame from a reduced copy, moreover that it does not add anything to the solution of the problem. It is enough to say, that the artist was striving to get whole numbers in every case: the last, exterior decorative contour framing the text reveals a very insignificant deviation from whole numbers: 62.2 x 39.1 sha'irahs. This slight error could be caused by any of the bordering thin frames (there are several), or it could be due to an accumulation of errors.

Thus we find the measure of length corresponding to the elements of the decorative design of this manuscript. We must take into account that the suggested origin of the manuscript (from Egypt) in this case again comes into contradiction with the measure of length applied to its decorations. The “Istanbul cubit” was introduced in Egypt 120 years later than the date of the Qur'ān manuscript analyzed here (see note 5).

After these two examples considered in detail it is enough to give only the principal characteristics of the samples from the catalogue by Déroche.

1. A manuscript of the Qur'ān dated by Déroche between 784/1382 and 801/1399, originating, in his opinion, from Egypt (Catalogue, No. 347) [4]. The decorative framing of the text on folio 2a (see fig. 2) presents a variant of the familiar pattern — square between two rectangles. Here the whole device is also basing upon the inner frame, a vertically set rectangle, its sides correlating as 8:5. The proportion is exact, the absolute measurements of the frame are 102.5 x 64 mm on the illustration, 243.8 x 152.4 mm in reality (the scale of the photograph is 16.75:40). This corresponds to 51.2 x 32 sha'irahs of the “Istanbul cubit” equal to 685.79 mm [5].

Three lines of the text on folio 2a of this manuscript divide the space of a rectangle 46 x 32 sha'irahs (placed within the frame, between the axes of two cartouches) into four equal parts. The distance between the lines is equal to 63.2 x 157.9 mm 35.5 x 88.9 mm.

2. A manuscript of the Qur'ān dated by Déroche between 801/1399, originating in his opinion, from Egypt (Catalogue, No. 506), dating, according to his statement record, approximately to 1124/1712 [7]. The size of the main frame, which is of white colour on the photograph (see fig. 3), is 106.6 x 62.2 mm (on the photograph — 80 x 46.6 mm, scale 40:40). It corresponds to 24 x 14 sha'irahs of the “Tripolitan cubit” equal to 640 mm [8]. Within the main frame there is a triptych — square (containing a text) between two rectangles. The vertical sides of the square are made thinner by yellow stripes running along them. It is constructed not too precisely — its height is shorter by several millimeters than its width: 62.6 x 58.7 mm. The length of the sections between the lines of decorative “fringe” (i.e. the distance between the neighboring lines) is equal to 3 Tripolitan sha'irahs.

3. A manuscript of the Qur'ān of Turkish origin (Catalogue, No. 506), dating, according to a waqf-statement record, approximately to 1124/1712 [7]. The size of the main frame, which is of white colour on the photograph (see fig. 3), is 106.6 x 62.2 mm (on the photograph — 80 x 46.6 mm, scale 40:40). It corresponds to 24 x 14 sha'irahs of the “Tripolitan cubit” equal to 640 mm [8]. Within the main frame there is a triptych — square (containing a text) between two rectangles. The vertical sides of the square are made thinner by yellow stripes running along them. It is constructed not too precisely — its height is shorter by several millimeters than its width: 62.6 x 58.7 mm. The length of the sections between the lines of decorative “fringe” (i.e. the distance between the neighboring lines) is equal to 3 Tripolitan sha'irahs.

4. A manuscript of the Qur'ān of the late 9th/15th century; Iran (Catalogue, No. 530) [9]. The familiar triptych “square between two rectangles” appears on the photograph of folio 2b of this manuscript (see fig. 4, right side). Its construction has some unusual features we have not met before. The triptych is inserted into a frame 15 x 11 sha'irahs (the cubit equal to 728.04 mm), which is equal to 75.8 x
لا يوجد نص могут быть прочитаны из этого изображения.
Fig. 5
Fig. 7
Among the specific features of this sample is the slight masking of the square in the middle of the main frame. Striking is the rectangular field assigned by the artist for the text of the manuscript. The field of the text is surrounded with a decorative frame. If we include the upper and the lower part of this frame into the text field, it will be restored to a square $8 \times 8$ sha'irahs or $40.4 \times 40.4$ mm ($33.8 \times 33.8$ mm on the photograph). Actually, this construction is concealing a whole series of squares — it is enough to demonstrate here the two most important ones. If we remove the upper (or the lower) rectangle from the triptych within the main frame, the combination of the two figures left will form a square, its side equal to $11$ sha'irahs ($55.5$ mm, on the photograph — $46.5$ mm). Once more we come across a hidden square (see above, sample 2); in the former case, however, it was just one of the figures of a triptych, now it is itself forming a canonical triptych filling the whole inner frame.

5. Manuscript of the Qur’ân of the 10th/16th century, India (?) [10]. The structure of the decorative device on folio 2a of this manuscript (see fig. 5) is similar to the one we have just considered. The size of the main frame is $32 \times 24$ sha’irahs of the “Egyptian cubit” equal to $581.87$ mm (129 x 96.9 mm, on the photograph — $80.8 \times 60.6$ mm). It includes the usual triptych which, however, being conventionally divided into two figures turns into a “hidden square” (i.e. a square $24 \times 24$ sha’irahs, plus a rectangle $8 \times 24$ sha’irahs). Within the triple composition the central figure of the triptych presents a square $16 \times 16$ sha’irahs set between two rectangles arranged vertically.

6. The Qur’ân copied in 1263/1847 by Ahmad al-Rafiq, originating from Turkey (Catalogue, No. 518) [11]. Folio 1b (see fig. 6) reproduced in the catalogue (fig. XXIV B; scale 39 : 40) has an external border framing the text, its size $15 \times 8$ sha’irahs of the “Tripolitan cubit” equal to $640$ mm (see above, sample 5). Its dimensions on the photograph are $65 \times 34.6$ mm, which must correspond to its real size of $66.6 \times 35.5$ mm.

7. The Qur’ân copied in 974/1567 by Muhammad b. Shams al-Din b. Muhammad al-Qádi, Iran (Catalogue, No. 533) [12]. Folio 3a (see fig. 7) reproduced in the catalogue (fig. XXVI B; scale 29.5 : 40) makes it possible to reckon that the text is framed by a narrow border, its dimensions corresponding to $28 \times 16$ sha’irahs of a cubit equal to $775$ mm (150.7 x 86.1 mm, on the photograph — 111.1 x 63.5 mm). Three lines written in large characters occupy the rectangles set within this frame, their sides equal to $3 \times 16$ sha’irahs ($16.1 \times 86.1$ mm, or $11.9 \times 63.5$ mm on the photograph). Two more frames with text are placed symmetrically between these rectangles — their size $10 \times 9.5$ sha’irahs, i.e. $53.8 \times 51.1$ mm (on the photograph — $39.6 \times 37.7$ mm).

8. A manuscript of the Qur’ân of the 10th/16th century, originating from Iran (Catalogue, No. 541) [13].

Its decorative device (Catalogue, fig. XXVI A; see fig. 8 in our reproduction) is basing upon a frame with the usual triptych, its size $58 \times 29$ sha’irahs of the “Egyptian cubit” of $581.87$ mm (which corresponds to $234.3 \times 117.1$ mm, on the photograph — $100.7 \times 50.3$ mm; scale 17.2 : 40). The “square between two rectangles” composition is set within the frame. The correlation of the three figures is proportional, all together they make a double square (14.5 x 29 + 29 x 14.5 = 58 x 29 sha’irahs).

Developing the decorative pattern of this page the artist managed to conceal the initial construction from the observer, substituting the left side of the frame for a new vertical line (AB on fig. 9), over which several layers of bordering were formed (in all there are ten frames). By shifting aside the left border of the main frame he changed the total area of the rectangle including the triptych, re-arranging it among the figures of the triptych (by means of a series of additional contours) in such a way, that the central figure — the square — received several unaccustomed visual interpretations simultaneously (two of these are marked with arches on fig. 9).

9. A manuscript of the Qur’ân, of the 10th/16th century, of Iranian origin (Catalogue, No. 540) [14]. Folio 1b of this manuscript (see fig. 10) shows a decorative composition basing upon a frame $34 \times 16.5$ sha’irahs of the “Egyptian cubit” of $581.87$ mm. As in the previous case, the artist shifted the frame to the right by $0.5$ sha’irahs. A new rectangle (a double square) $34 \times 17$ sha’irahs was formed between the left border and the new right border. Within this rectangle there is a triptych formed by two figures $11 \times 17$ sha’irahs and one figure $12 \times 17$ sha’irahs, the last one including a square $12 \times 55.6$ mm (on the photograph — 63.5 x 46.6, scale 33.5 : 40).
One can not be absolutely sure of the exactness of the measurements given here, because the photograph is too much reduced (its scale is 26:40), and the border framing the figures of the triptych is not narrow enough to be ignored and not wide enough to be properly taken into account in measurements.

The use of the “Egyptian” and not other similar cubit is, however, well confirmed here by a frame composition around the text on folio 283 of the manuscript (it is reproduced on fig. XXVIII A of the catalogue; the scale is slightly different — 25.75:40). Within a frame 35 x 20 sha'ārāhs (141.4 x 80.8 mm, on the photograph — 92 x 52 mm) three lines written in large characters occupy three rectangles 5 x 20 sha'ārāhs (20.2 x 80.8 mm, on the photograph — 13.1 x 52.5 mm). Two more text frames are arranged symmetrically between them (their size — 10 x 14 sha'ārāhs = 40.4 x 56.6 mm, or 26.2 x 36.7 mm on the photograph). The composition of frames on this page is practically identical with that on folio 3a of the manuscript described in the catalogue under No. 533 (No. 7 of the present article).

The last sample — folio 1b (see fig. 11) from a miniature Qurʾān manuscript of the 10th/16th century, originating from Iran [15]. Its life-size reproduction is given in the catalogue. The size of the frame — 52.5 x 31.4 mm — which corresponds to 15 x 9 sha'ārāhs (if we take a cubit equal to 503 mm [16]). The length of a section between the lines of the scale canvas formed by a “fringe” is equal to 2 sha’ārāhs of this cubit.

Let us summarize the results of our investigation.

The number of samples in the illustrative supplement to catalogue of Arabic manuscripts by Déroche, presenting certain common features — first of all, the presence of lines projecting beyond decorative frames to the margins of folios — are confined to these ten manuscripts from Bibliothèque Nationale. They were included into the supplement for reasons which have nothing to do with the subject of our investigation. They can be regarded therefore as a chance selection from a great number of samples of the same type preserved in libraries. We may expect that our suggestion (that the “decorative fringe” in Arabic manuscripts presents at the same time a scale canvas) will not be disproved by any other group of manuscripts with similar decorations.

It turned out that in ten manuscripts seven different measures of length had been applied by their decorators. We were aware of their existence before, but only from literary sources, not coming across them in real measurements. Thus we discovered a new source in illuminated manuscripts, which presents a good opportunity to check the available data and is promising some revival in the field of historical metrology. There is nothing sensational, as we can see, in our first tests. Still, they have confirmed the validity of the data we have, at the same time demonstrating the precision of medieval instruments and the accuracy of manuscript decorators using them.

I expect that the suggested method of analysis of elaborate manuscript decorations which can be attributed to the “scale canvas” group, will be of some significance to art historians. Within this method three components should be distinguished: determination of the measure of length; reckoning of the main ornamental frame; classification and description of all decorative elements. The study of new samples will, probably, reveal other possibilities of this method.

New possibilities are opening also for codicologists. The materials surveyed here make us consider the problem of the significance of historical length measures for determining the origin of manuscripts. Let us remind the reader that our attribution of the cubits in some cases contradict the locations indicated in the French catalogue. Further development in this direction seems expedient and worthwhile.

Finally, it should be mentioned that while working on this article the author had no opportunity to handle all the manuscripts mentioned here, which he was greatly missing. This had been planned, but the financial conditions of the time when the article was being written made it impossible. For this reason all the arguments in the article were confined to computations, and the article itself is just stating the problem but not solving it.

Notes

2. Ms. Arabe 418. In the catalogue this manuscript is described under No. 535.
5. Hinz, p. 67 (with a further reference to the Chronicle by Ibn Iyās, a 15th—16th century author; there it is mentioned that the “Istanbul cubit” was introduced in Egypt in November 1521).
6. There is a noticeable error in its construction.
10. Ms. Arabe 400.
12. Ms. Arabe 5816.

I l l u s t r a t i o n s
(clichés Bibliothèque Nationale de France Paris, copyright B.N.F.):

Fig. 1. Ms. Arabe 418, fol. 3a (= F. Déroche, pl. I).
Fig. 2. Ms. Arabe 5841, fol. 2a (= F. Déroche, pl. IV A).
Fig. 3. Ms. Arabe 501, fol. 2a (= F. Déroche, pl. V B).
Fig. 4. Ms. Arabe 427, fols. 2a, 2b (= F. Déroche, pl. VI B and C).
Fig. 5. Ms. Arabe 400, fol. 2a (= F. Déroche, pl. VII B).
Fig. 6. Ms. Smith-Lesouëf 206, fol. 1b (= F. Déroche, pl. XXIV B).
Fig. 7. Ms. Arabe 5816, fol. 3a (= F. Déroche, pl. XXVI B).
Fig. 8. Ms. Smith-Lesouëf 218, fol. 2a (= F. Déroche, pl. XXVII A).
Figs. 9—10. Ms. Smith-Lesouëf 215, fol. 1b (= F. Déroche, pl. XXVIII B).
Fig. 11. Ms. Arabe 426, fol. 1b (= F. Déroche, pl. XXIX B).
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Front cover:
The cakra for the separation of the guardian deities from the person they are protecting. A separate folio, 55×20 cm.

Back cover:
Plate 1. Cakras for summoning spirits of foes and for warding off evil spirits, as well as the articles used to perform the ritual for propitiating of the goddess IHa-mo. A separate folio, 55×20 cm.
Plate 2. The cakra for the suppression of the dam-sri spirits. A separate folio, 55×30 cm.
Plate 3. Cakras for calming illnesses and acquiring wealth, and the articles used to perform the corresponding ritual. A separate folio, 55×20 cm.