

HARAPPAN GEOMETRY AND SYMMETRY: A STUDY OF GEOMETRICAL PATTERNS ON INDUS OBJECTS

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The geometrical patterns on various Indus objects catalogued by Joshi and Parpola (1987) and Shah and Parpola (1991) (CISI Volumes 1 and 2) are studied. These are generally found on small seals often having a boss at the back or two button-like holes at the centre. Most often these objects are rectangular or circular in shape, but objects of other shapes are also included in the present study. An overview of the various kinds of geometrical patterns seen on these objects have been given and then a detailed analysis of few patterns which stand out of the general lot in terms of the complexity involved in manufacturing them have been provided. It is suggested that some of these creations are not random scribbles but involve a certain understanding of geometry consistent with other aspects of the Indus culture itself. These objects often have preferred symmetries in their patterns. It is interesting to note that though the *swastika* symbol and its variants are often used on these objects, other script signs are conspicuous by their absence on the objects having geometric patterns.

Key words: CISI volumes, Geometric pattern, Grid design, *Swastika*

1. INTRODUCTION

Towns in the Indus valley have generally been recognised for their exquisite planning with orthogonal layout. This has been used to appreciate their understanding of geometry of rectangles and related shapes. However, another window to understand their capabilities to appreciate the geometrical patterns on their objects and other materials will be of interest.

Corpus of Indus Seals and Inscriptions (CISI) Volumes 1 and 2 contain photographic documentation of all known objects from Indus region available in

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the collections of objects in India and Pakistan respectively. Examples from these volumes are taken to analyse objects with geometrical patterns in order to understand their comprehension of geometry and throw light on the technological competence of the Indus people. In the past, the beautiful art work on the motifs has been commented upon but these motifs largely exhibit the artistic style and imagination of the Indus people.

The geometrical patterns on the Indus objects, which throw light on their ability to imagine and understand complex and abstract shapes were studied. All the images are taken from CISI Volumes 1 and 2. The objects come largely in rectangular shape but a large number of circular shaped objects are also known. Some of the objects are of shapes highlighting their central motif. The compilations (CISI Volumes 1 and 2) have used alpha-numeric codes to identify the objects. These are the CISI numbers assigned to each object and are reproduced with the images in the paper.

2. INDUS OBJECTS: SELECTION CRITERION

Various kinds of geometrical patterns on Indus objects from CISI Volumes 1 and 2 are analysed. These are generally found on small - rectangular and circular seals - often having a boss at the back or two button-like holes at the centre. Some objects of irregular shapes are also included in the present study. A list of all objects analysed in the paper is given in Table 1 in Appendix. Table 1 also provides other relevant information such as CISI number, site of occurrence, shape, size and some general comments on these objects.

Out of the 4695 slides with illustrations on objects listed in CISI volumes 1 and 2, a total of 337 have geometrical designs on them. Others have script, animal motifs, pottery markings etc.*

2.1 Rectangular objects

A large fraction of the Indus objects are of rectangular shape and have various types of geometric designs on them. This section broadly discusses the geometric patterns on these objects. Of these, a total of 31 objects have *swastika* marks on them, including one object (H182) which has 5 *swastikas* on it. The only other single design that appears very frequently is that of concentric circles. Apart from a large number of them, several (up to 9) of them also appear on a single object.

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2.1.1 The 'Swastika' Symbol

The *swastika* symbol (Fig. 1) is one of the most common geometric shapes in the corpus. This symbol appears in the sign list of Indus script (Sign no. 148 in the concordance of Mahadevan, henceforth referred to as M77). Elsewhere



M-332 a

Fig. 1. *Swastika* Image from Mohenjo daro

(Yadav and Vahia, 2009) examples of some individual symbols with remarkable similarity to signs in M77 are shown. Moreover, the *swastika* symbol itself appears in three other forms (Figs. 2-4).

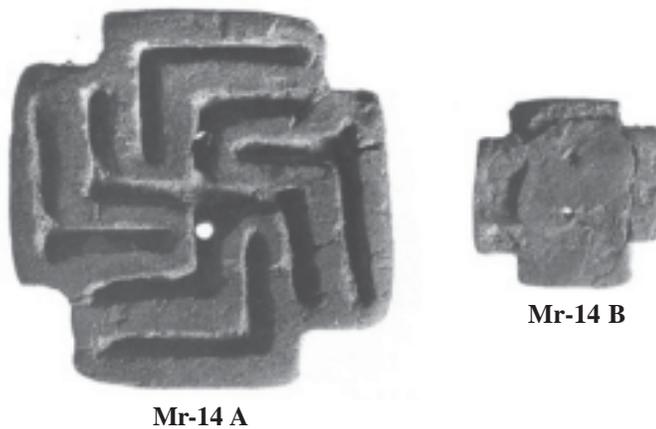


Fig. 2. One variation of *swastika* with open lines

**M-339 a****Fig. 3.** Second variation of *swastika* symbol.**M-341 a****Fig. 4.** Third variation in *swastika* symbol.

Unlike the example given in Fig. 2, these objects rarely have holes. There are other minor variations of this design given in Fig. 3 such as L-71, H-118 of Joshi and Parpola (1987). There is one example of a *swastika* of the type given in Fig. 5 with a complex geometrical sign at the back. Amongst all the *swastika* objects, this one is probably the most complex with one line *swastika* in the

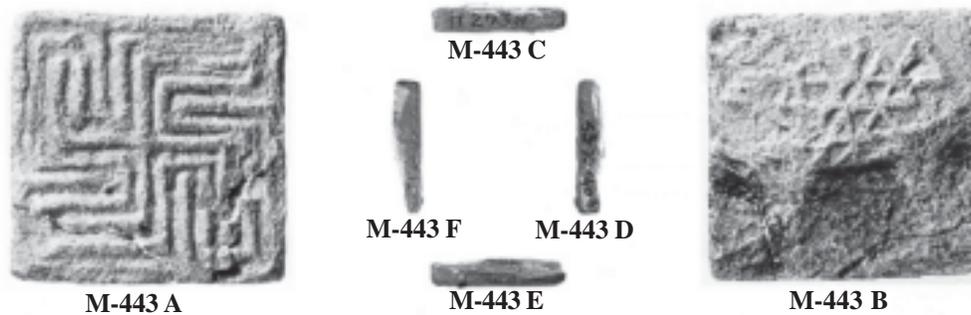


Fig. 5. A case of *swastika* symbol with a complex geometrical design behind it.

middle, circumscribed by a solid *swastika* outline and lastly enclosed in a square with protrusions into the 4 quarters that mark the central part of *swastika*.

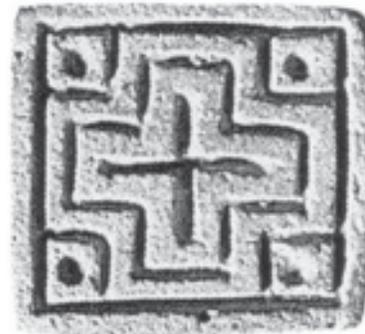
Talpur (1994) has extensively worked on the geometry of button seals, especially on the *swastika*, stepped cross motifs and designs with diagonals and circles. Taking a basic square shape, she divides it into a pattern of 3 x 3 squares and calls it as a principal figure. She then goes on to show that this principal figure can be used in a versatile manner to produce a whole lot of designs which are seen on the button seals, such as the ones appearing in Fig. 13 and that the line segments in each case adds up to 24 units (or inches). This is shown to be true for the *swastika*, stepped cross motif and other designs with diagonals and circles found on the button seals. She therefore concludes that the geometric designs on the button seals seem to conform to certain specific set of rules and that it indicates usage of a standard set of proportions that may have been culturally acceptable.

2.1.2 The '+' design

The next common design is with a '+' in the middle and covering lines around (Figs. 6-9). There are several subtle variations of the same (see also Fig. 18).

2.1.3 Grid designs

There are several designs where the designs are more in the form of grid. The simplest one simply divides the area into 4 equal parts (Fig. 10). These objects often have two holes passing through them or a boss at the back. The location of the holes and the size of these objects suggest that they may have been

**L-75 A****Fig. 6.** Basic '+' design.**M-1255 A****Fig. 7.** One variation of '+' design.**H-122 A****Fig. 8.** Second variation of '+' design.**M-1257 A****Fig. 9.** Third variation of '+' design.

used as buttons or amulets with thread passing through the two holes or the single hole.

A more interesting version of the same is given in Fig. 11.

A more extensive grid design is given in Fig. 12. Several variations of this, not reproduced here, are seen (H-126, H-127, M-496, M-497, H-125).

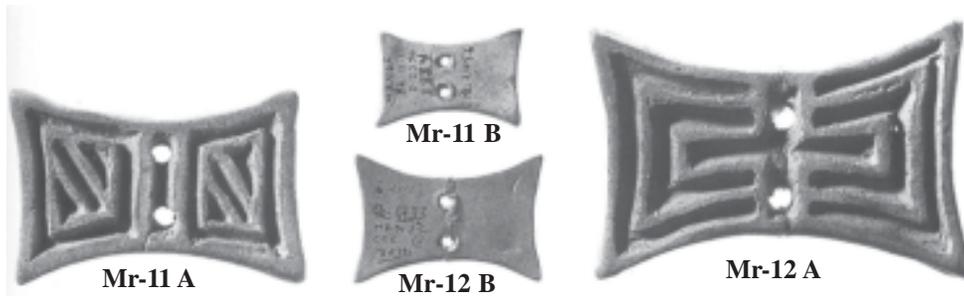
The geometrical pattern in Fig. 12 shows a measure of technological sophistication indicating high degree of proficiency. The lines from top left to



Pk-20 A

Pk-20 B

Fig. 10. Simplest grid inscription.



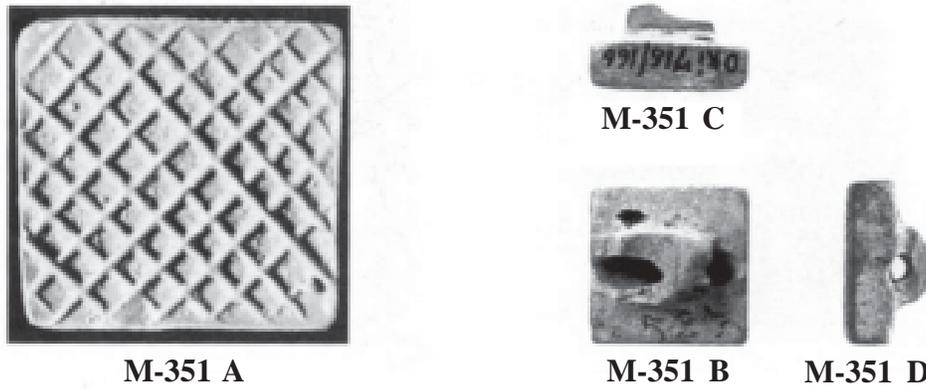
Mr-11 A

Mr-11 B

Mr-12 B

Mr-12 A

Fig. 11. More involved grid structure.



M-351 A

M-351 C

M-351 B

M-351 D

Fig. 12. Complete geometrical grid. Note that the grid is of 6 points at each end. The spacing is also meticulously worked out with spacing error of about 10% as measured along the longest diagonal.

bottom right are spaced with an average spacing of 1.13 ± 0.15 mm (or 13% error) for the 11 lines drawn. The lines going from bottom left to top right are spaced with a spacing of 1.23 ± 0.09 mm (or 7% error) for the 10 lines drawn

there. It is noted that within the range of errors, lines in both the directions are equally spaced. It is noted that the object is not a perfect square and that the error is also reflected in the fact that while the line from bottom left to top right is nearly along the diagonal, the other is not. Also, while for most of the lines, the lines from top left to bottom right appear to be below the lines from bottom left to top right, one line seen from top left seems clearly to ride above all other lines.

2.1.4 Other variations in designs

Some examples of few other kind of geometric designs on square objects are given below. These objects are also well made with a fair degree of accuracy. For the object M-350 (Fig. 13), the outer squares have a thickness of 1.5 mm. For H-119, the spacing between the lines in each of the quarters is 1.5 mm. For H-637, the line spacing is 1.0 mm between consecutive lines of the diagonal and for H-124; the four lines along the diagonal are 0.5 mm while spacing between lines of the outer box is 1.0 mm.

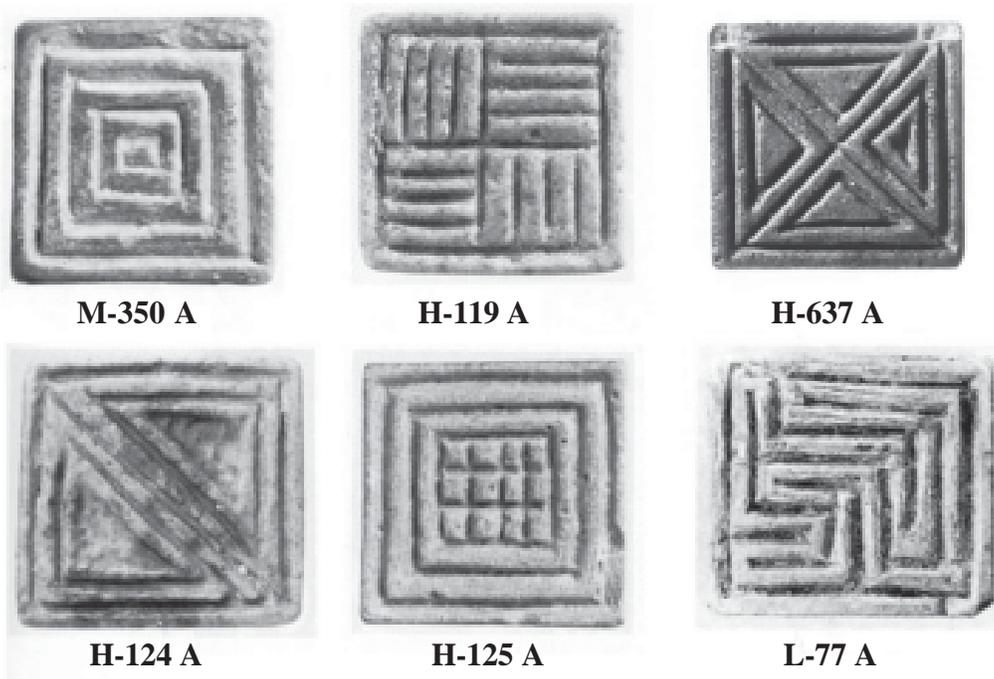


Fig. 13. Other geometric designs on square objects.

2.2 Circular objects

Some of the most spectacular objects are circular in shape. There is at least one example (M-416) which is a circular object with writing on the top and motif at the bottom and is a characteristic of written Indus inscription. Other two objects not shown here (H-247 and H-248), have only script characters written in circular manner. However, in general the circular objects have geometric patterns, dividing the circle into different symmetrical patterns. There are very few examples of asymmetric designs or of non circular - non square or rectangular objects (vide Pk-43). Some of these patterns on circular objects are examined.

2.2.1 Circular objects with 4-fold symmetry

Several circular objects have 4-fold symmetry, dividing the circular area into 4 quadrants. There are several examples (Mr-5, Pk-15, Pk-16, Pk-17, Pk-22, Pk-23, Pk-33, Pk-35, Pk-39) of circular objects having 4-fold symmetry with a '+' sign, similar in pattern to the example given in Fig. 6 above, except on a circular format (vide Pk-29). Figs. 14-16 give examples of the same.



Pk-46 A

Fig. 14. Circular object with 4-fold symmetry.



Ns-2 A

Fig. 15. Object with 4 circular patterns.

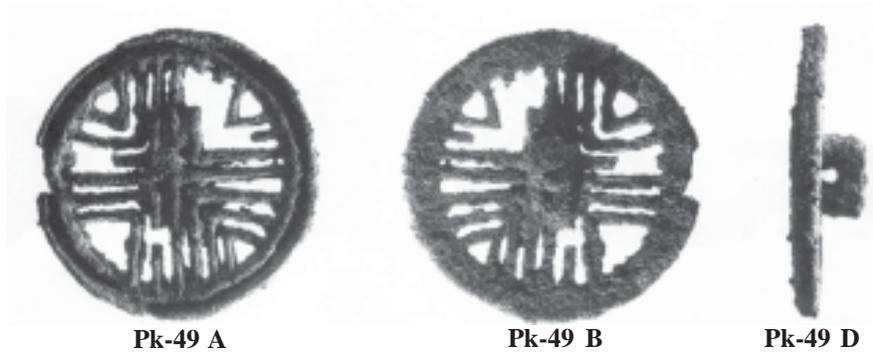


Fig. 16. A 4-fold symmetric copper object with fine work. Note that this object is divided into 4 parts using a '+' sign and each quadrant is further divided into 8 marks each.

Fig. 16 shows a copper object with extremely intricate working, where the material is made transparent by removing the back material. Note that the size of the object is 5.4 cm.

The pattern given in object Sht-1 (Fig. 17) is representative of several objects (vide C-42) with similar structuring. It is particularly interesting since the symmetry seems to have been *intentionally broken* by not completing the pattern on the top and doing so partially at the bottom with a central wriggle taking it to the middle. Clearly, the artist had an idea about symmetry and chose not to make the inscription completely symmetrical.

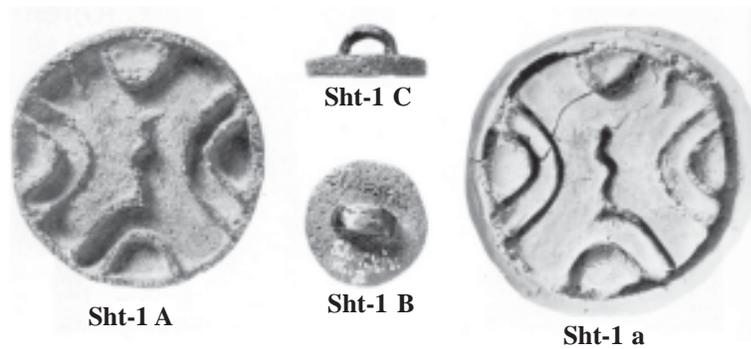


Fig. 17. Circular object with geometric pattern and 4-fold symmetry.

An interesting variation in this the inscription Pk-13 (Fig. 18) with 21 pits dug into it with a configuration of 4, 6, 7 and 4. Another example of this kind is the inscription H-638 where a square object is divided into 4 parts with an 'X' sign and each part of the 4 'V' shapes so formed is filled with 1 circle.

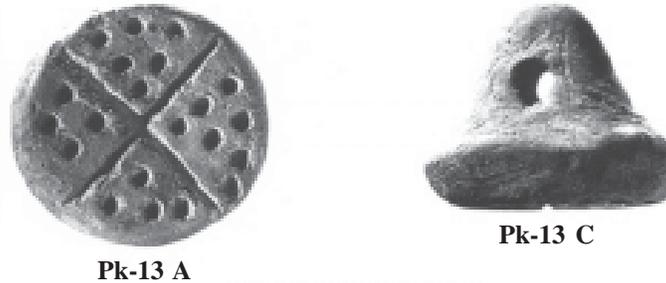


Fig. 18. 4-fold symmetry with 21 circular marks, 2 quadrants have 4 pits, 1 with 6 pits and 1 with 7 pits.

2.2.2 Objects with 5-fold symmetry

There are 2 examples of objects with 5-fold symmetry. Of these one (C-50) simply has a marking of a 5-fold star while the inscription, C-49 (with an identical pair in C-50) is interesting (Fig. 19).



Fig. 19. Inscription with attempted 5-fold symmetry.

In this object, one side shows an animal and other side has a five pointed shape made by connecting 5 'J' shaped design. Relative angular separation of each 'J' shape seems to have been done well.

2.2.3 Object with 6-fold symmetry

Only one object with excellent workmanship with 6-fold symmetry (Fig. 20), but is interestingly found, though the head of the animal is different for each of the six parts of the pattern, the pattern is symmetric with respect to the central region till the head of the animals. This is probably the only example of 6 fold symmetry. This suggests that this symmetry was not commonly used.

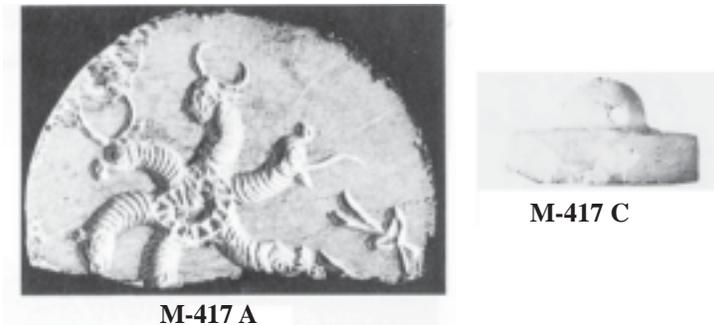


Fig. 20. Object with a pattern having 6- fold symmetry.

2.2.4 Objects of 7-fold symmetry

There are a large number of objects with a variety of designs having 7-fold symmetry. We reproduce only 5 of the objects of this class (Figs. 21-25), all of which show different patterns but they all have 7-fold symmetry.

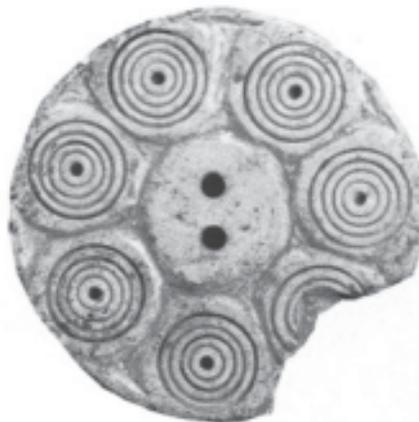


Fig. 21. 7-fold symmetry in a magnificent carving.

The intricate nature of Fig. 21 is breathtaking. The object diameter is 3 cm. The object is divided into 7 parts. Each part has a ring of 4 concentric circles and a filled circle in the middle. The relative sizes of the concentric circles within each part are identical to an accuracy of 1%, which is the measuring accuracy. It shows a level of consistency which is not achievable unless all the units were made from the same mould. This is confirmed by the fact that the relative distance between the centers of each part is accurate to about 5%.



H-243 B

Fig. 22. 7-Fold symmetry with pipal leaves.

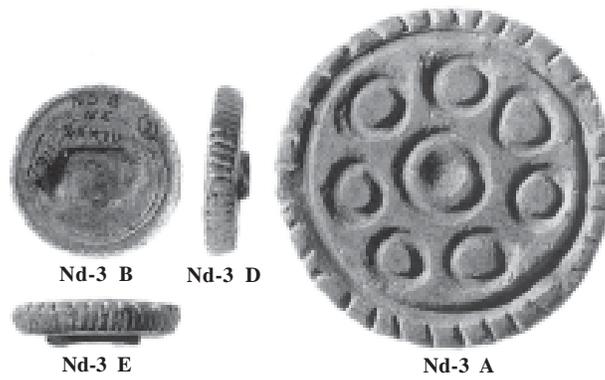


Fig. 23. 7-fold symmetric inscription made with circles (see also M-1654).



Pk-24 A

Fig. 24. 7- fold symmetry with star shape.



Fig. 25. 7-fold symmetry with star and concentric circles.

Apart from this, there are several objects with 7 human or mythical figure markings. It is also noted that the sign of 7 short lines in the Indus script is almost always accompanied by sign no. 194 which looks like hut (see Mahadevan, 1977). It is felt that the number 7 had an importance in the Indus culture.

2.2.5 Objects with eight-fold or higher symmetry

One unambiguous case of an object of clear 8-fold symmetry (Fig. 26) is found. There are other unclear examples such as Pk-25 where the division is not unambiguous.

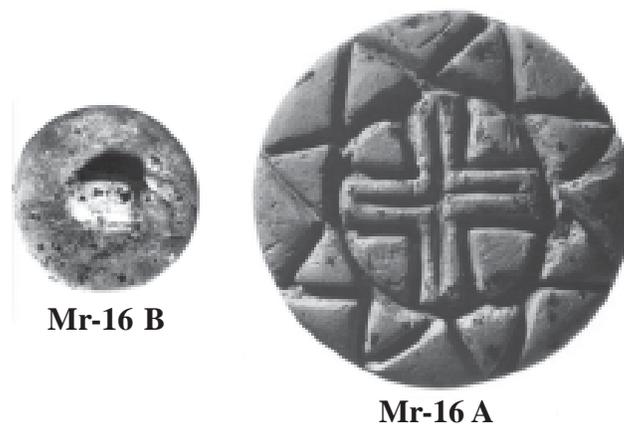


Fig. 26. Object with 4 and 8 fold symmetry.

Another example of eight fold symmetry is given in Fig. 27 where there are two sets of eight markings, each making the complete pattern.

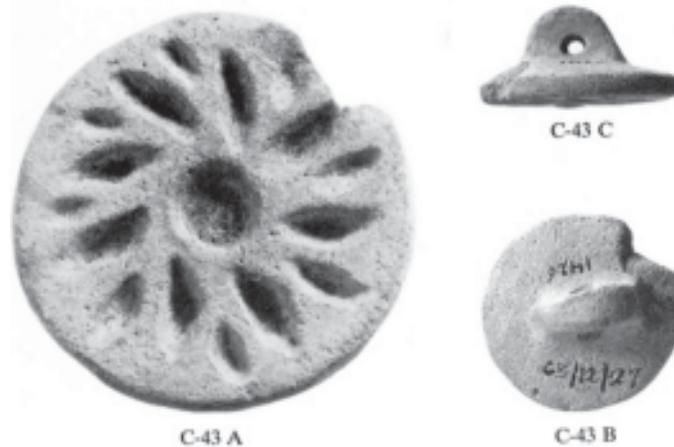


Fig. 27. An inscription with a double eight- fold symmetry.

2.2.6 Objects with inscribed concentric circles

In Fig. 21, an example of circles with several concentric rings within them is given. Objects with such concentric circles are discussed. While the object in Fig. 21 is unique, there are several examples of less exquisite objects with concentric circles. The simplest example of this kind of symbols is given in Fig. 28.

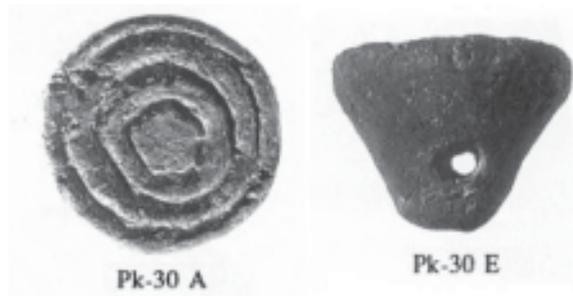


Fig. 28. Objects with concentric circles.

There are several examples of this kind (e.g. H-337, H-338, H-342). There are examples of objects with Indus signs on one or more sides and these concentric circles on other sides as in H-362 (Fig. 29), H-359, H-364, H-367, L-100 etc. Of these, H-855 is probably the strangest with 3 sides, all of which have these concentric circles.

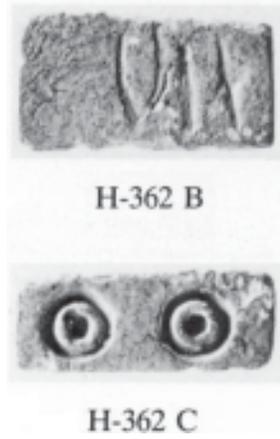


Fig. 29. Objects with two concentric circles.

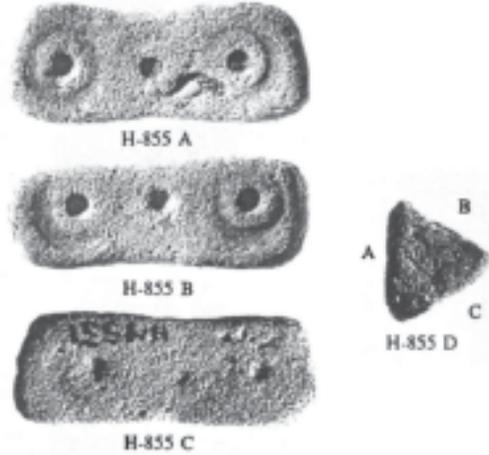


Fig. 30. Object with concentric circles on all 3 sides.

There are several objects with three such rings (e.g. H-365, H-352, H-353, H-356, H-357, H-361, H-972, H-978 etc.). Some objects such as M-1260 have 4 rings on them. These concentric circles seem to be of importance since they also appear in a combination (Fig. 31).

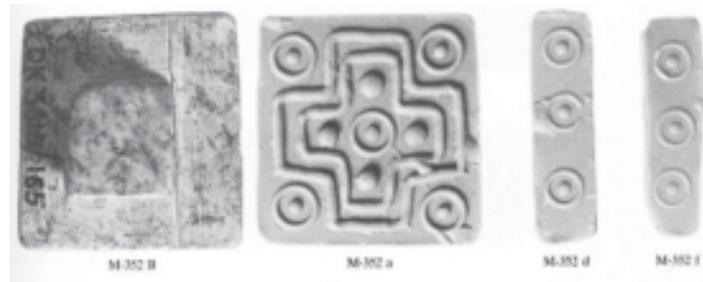


Fig. 31. Object with several sign combinations

2.2.7 Miscellaneous objects

In this section some examples of objects which do not fit into a standard pattern but are nonetheless are very interesting have been listed. The object in Fig. 32 for example has several artistically drawn lines that make a pleasant pattern with the feel of a finger print.

In contrast to Fig. 32, the objects shown in Fig. 33 have a jagged shape. Considering their small size and the holes inside them they appear more like button type objects.



Fig. 32. An artistic inscription.

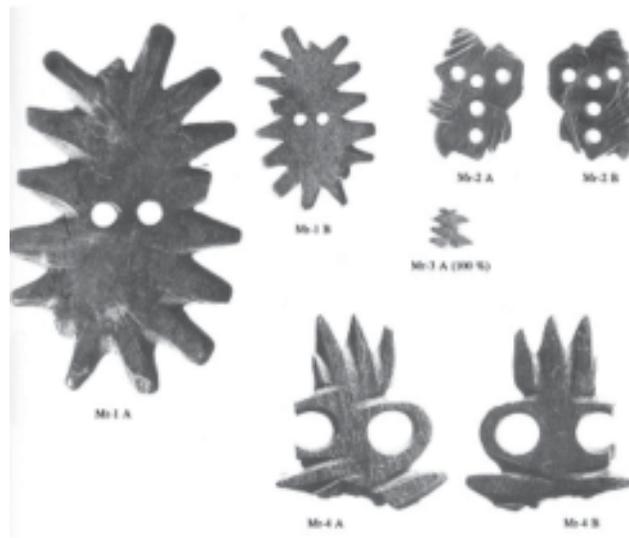


Fig. 33. Objects with sharp edges.

The objects in Figs. 34 to 37 have four different types of patterns, the first one being rectangular with a rather poor quality cross and dots on the border. Fig. 35 appears more like a board for game with a mesh like structure and dots in between.

Against that, the object shown in Fig. 36 is divided into layers made with horizontal line (as presented here, based on the direction of hole taken to indicate the horizontal line) with vertical lines separating the layers. It can be argued to be a depiction of two animals with 4 legs stacked on top of each other.

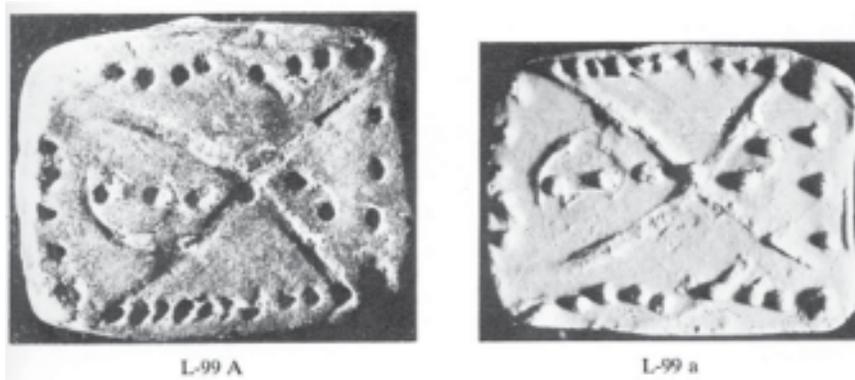


Fig. 34. Objects with multiple markings. There are a total of 32 markings with 8+6+10+8 markings in each quadrant starting with the top and counting in clockwise direction.



Fig. 35. A circular object divided into a checkered pattern with 9 markings.



Fig. 36. Inscription with marking of 8 lines (see also C-48).

Fig. 37 is a representation of a shape with several perforations. If the objects with two central holes are indeed buttons, then this object could well be a button with 8 decorative perforations on the outside.

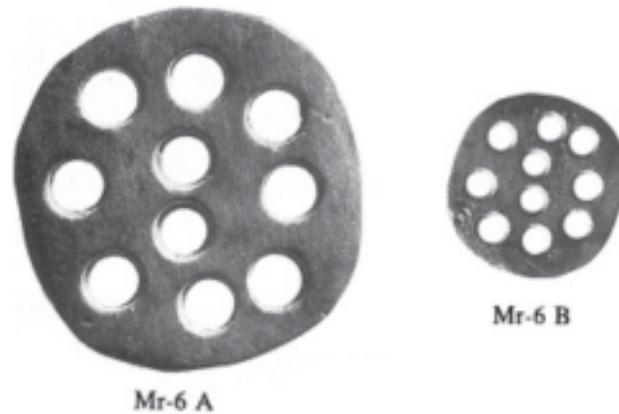


Fig. 37. Object with 10 holes or 8 holes with two central additional holes for holding, as has been seen in other objects.

Figs. 38 and 39 also demand separate attention since they are made with circular material scooped out of the shape. While the object in Fig. 41 is made with an 8 sided basic shape, with 8 perforations on the outside, 4 perforations in the middle and one at the centre, the object in Fig. 42 simply has 24 scoops on a rectangular object with no apparent pattern.

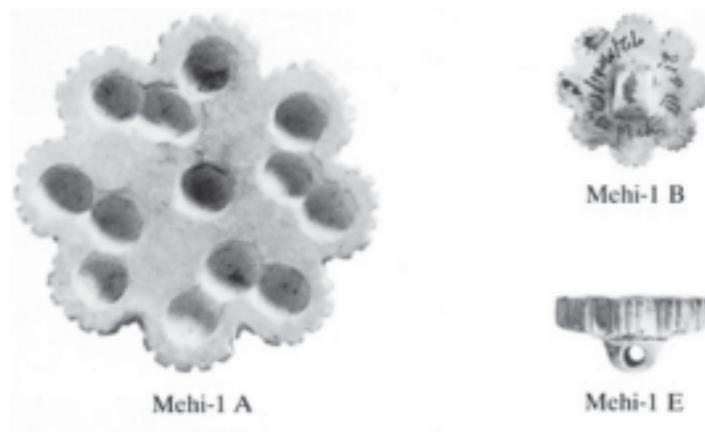


Fig. 38. Inscription with 12 circular blobs in a rough 4-fold symmetry with an additional central blob.

Figs. 40 and 41 indicate truly miniature objects with complex (Fig. 40) or animal like external shape (Fig. 41).

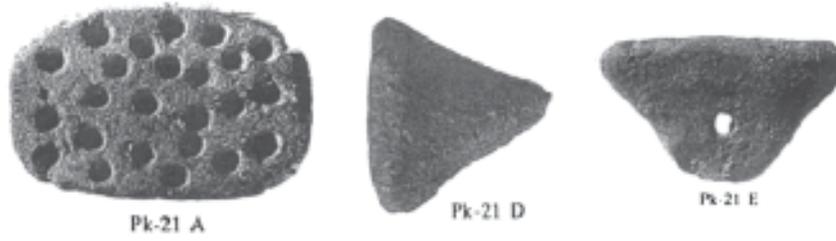


Fig. 39. A rare oval inscription with 24 holes.

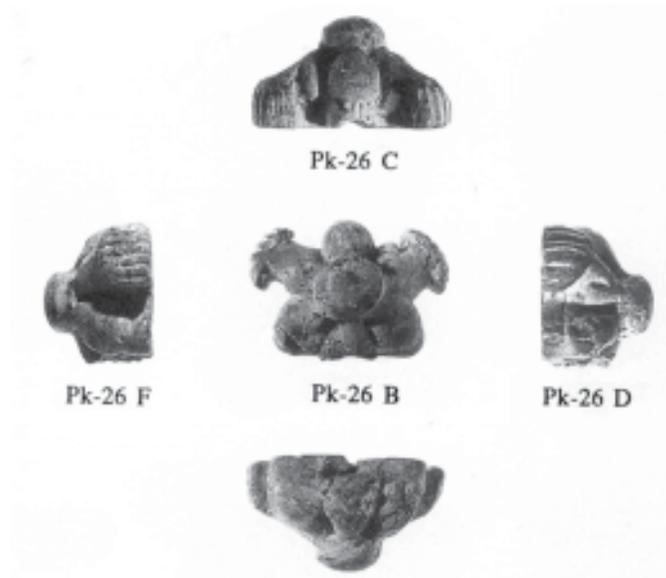
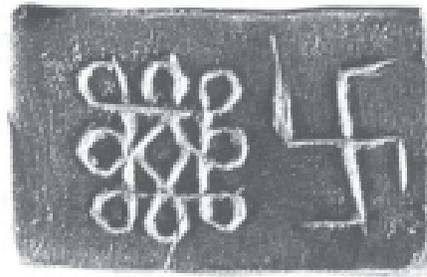


Fig. 40. A remarkable miniature inscription.



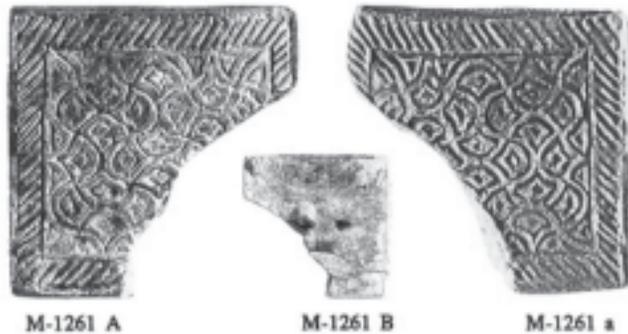
Fig. 41. A complete object with a cow like shape.

Fig. 42 has two geometrical patterns that are used even today as good luck signs at special functions. While one can argue on whether this is a chance occurrence or whether there is continuity in tradition, the evidence is not enough to make a firm conclusion. Fig. 43 is an example of a square tile where an intricate pattern completely fills up the square and is carefully marked on the outside.



M-1356 ■

Fig. 42. A rectangular inscription with *swastika* and another sign.



M-1261 A

M-1261 B

M-1261 a

Fig. 43. An elegantly and intricately carved object in bass and relief. Note that the pattern fills the central region without leaving a gap.

Fig. 44 is a shape of great flamboyance more in appearance like a tree. Note that the Fig. shows *two sides* of the same object with fountain like shape on both the sides.

Fig. 45 is an example where animal motifs are drawn in a fundamentally different, geometrically fitting shape where natural curves of animals have been firmly fitted into more ideal geometric shapes.

The last object discussed is Mr-10. It is a magnificent example of geometric design done with great care. This diameter of this object is about 5 cm. It consists

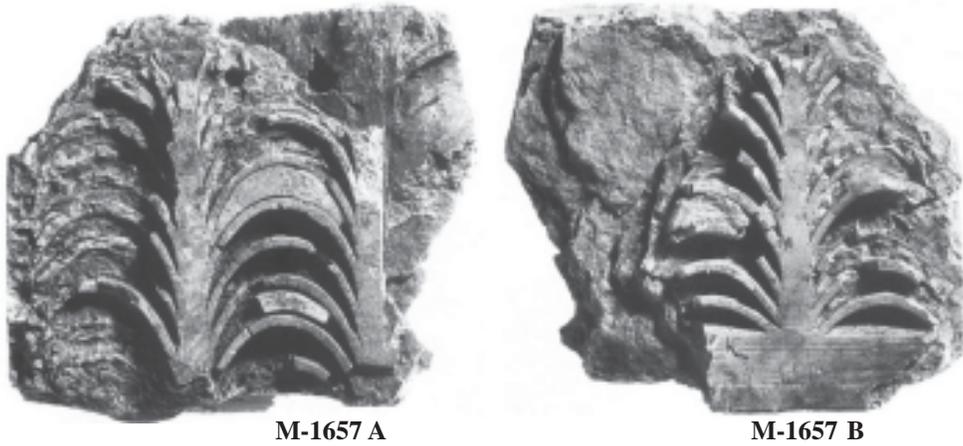


Fig. 44. An object with a tree pattern. The trees, on both sides of the seal have exactly 8 branches on each side.



Fig. 45. An object with engravings that appear to be 2 Scorpions on one side and 2 four legged animals on the other.

of 2 'wheel like' patterns, the outer one with 20 spokes and the inner one with 12 spokes. The width of each of the outer and inner arcs and the radial lines that connect them for both the wheel like pattern have been measured. For the outer pattern, fluctuations in the outer arcs are about 8% while that of inner arcs it is 14%. Fluctuations in the lines joining them are about 10%. In the case of the inner pattern, the outer arcs have fluctuations of the order of 12% while the inner arcs have fluctuations of the order of 22%. The lines joining them have fluctuations of the order of 5%. These fluctuations on the radial side are consistent with workmanship on this size. However, the fluctuations along the arc are relatively small. In the case of the outer pattern, the length of the perimeter is 31.4 cm. This

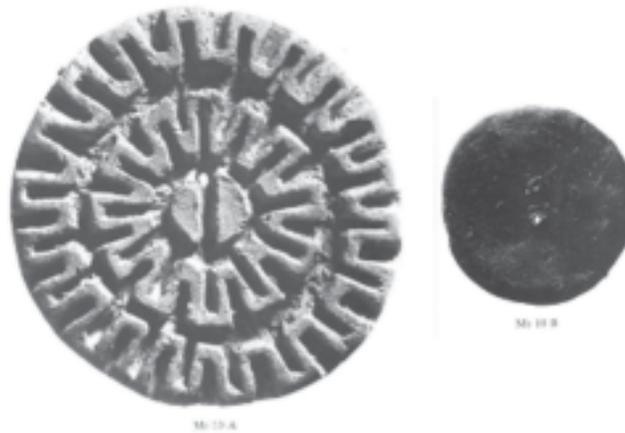


Fig. 46. One of the most beautiful early objects from Indus period depicting 20 spokes on the outer circle and 12 spokes on inner circle. It possibly has 2 holes in the centre.

amounts to 8 mm per arc. Ten percent error on this amounts to an error of 0.8 mm. This is a remarkably small error.

3. Discussion

Some remarkable objects with purely geometric patterns found in CISI Volumes 1 and 2 have been discussed. These examples show that in addition to geometry, the patterns fall into groups of a small number of symmetric patterns.

The geometric patterns on Indus objects give an idea of not only the artistic skills of its makers but a more precise information on their understanding of formal geometry of planar objects as well as their preferences for some special symmetries.

Objects such as Mr-10 and NS-3 indicate that the manufacturers of these objects had remarkably good knowledge of circular geometry. From the idea of abstract geometrical concepts, the most remarkable piece is the object M-1261. This 2 cm square seal has an interesting tiling. A triple curved, pattern in equilateral triangle style completely fills up the given area without leaving any gap. This type of geometry was subsequently not explored until the rise of Islamic Empire and its emphasis on abstract styling is worth noting.

The emphasis on the external shape and internal pattern seems to be specific. However, it is noted that the symmetries or number of similar patterns

used most frequently on the objects are 4, 7, 12, 20 and 24. It is likely that these are calendrical or time markers. 4 could be suggestive of 4 seasons, 7 of either seven planets (mercury, venus, mars, jupiter, saturn, moon and sun) or quarter of a month while 12 of months. Number 24 could be number of fortnights in a Lunar Calendar. It is suggested that both, the selection of dimensions and the symmetries of design patterns, indicate a degree of complex coding of cultural ideas that may have implications beyond simple design motifs and may encode other important pieces of information.

The Indus objects need to be carefully studied to provide new insights into the knowledge they contain.

CONCLUSION

In the present paper it has been attempted to classify the diverse geometric patterns and symmetries seen on Indus objects into different categories. It is shown that they often used only a fix set of symmetries and select number of divisions in their geometrical patterns. It is suggested that some of these creations are not random scribbles but involve a certain understanding of geometry consistent with other aspects of the Indus culture itself. Taking some specific examples it is shown that the precision in their workmanship was remarkable and practically stretched the limit of human capabilities in creating miniature objects. Wheeler has justifiably said the following on these objects: “At their best, it would be no exaggeration to describe them as little masterpieces of controlled realism, with a monumental strength in once out of all proportion to their size and in another entirely related to it” (Wheeler 1968: 101 as quoted by Possehl, 2002: 11).

ACKNOWLEDGEMENT

We wish to acknowledge the grant received from Sir Jamsetji Tata Trust. We would also like to thank Iravatham Mahadevan for the encouragement.

Appendix

Table 1: List of objects discussed in the paper

Fig. no	CISI No.	Site	Shape	Size (in cm)	Comments
1	M-332	Mohenjo – daro	Square Seal	1.5 × 1.5	With perforated boss
2	Mr-14	Mehrgarh	Square Seal	2.8 × 2.8	
3	M-339	Mohenjo – daro	Square Seal	1.9 × 1.9	

4	M-341	Mohenjo – daro	Square Seal	1.5 × 1.5	
5	M-443	Mohenjo – daro	Copper tablet in bas – relief	2.4 × 2.4	
6	L-75	Lothal	Square Seal	1.6 × 1.6	Square perforated boss
7	M-1255	Mohenjo – daro	Square Seal	1.7 × 1.7	With perforated boss
8	H-122	Harappa	Square Seal	1.5 × 1.5	With perforated boss
9	M-1257	Mohenjo – daro	Square Seal	1.4 × 1.4	With perforated boss
10	Pk-20	Pirak	Square seal compressed in the middle	3.6 × 3.6	
11	Mr-11 Mr-12	Mehrgarh Mehrgarh	Rectangle curved in the middle	2.7 × 1.7	Two holes in the middle and curved.
12	M-351	Mohenjo – daro	Square Seal	1.9 × 1.9	Perforated boss
13	M-350	Mohenjo – daro	Square Seal	1.5 × 1.5	With perforated boss
	H-119	Harappa	Square seal	1.7 × 1.7	With perforated boss
	H-637	Harappa	Square seal	1.7 × 1.7	With perforated boss
	H-124	Harappa	Square seal	1.8 × 1.8	With perforated boss
	H-125	Harappa	Square seal	1.7 × 1.7	With perforated boss
	L-77	Lothal	Square seal	1.8 × 1.4	With perforated boss
14	Pk-46	Pirak	Circular Seal	2.8 dia	
15	Ns-2	Nausharo	Square object	3.2 × 3.2	
16	Pk-49	Pirak	Circular Seal	5.4 dia	
17	Sht-1	Shahi – tump	Circular Seal	2.9 dia	Foreign (?)
18	Pk-13	Pirak	Circular Seal	2.6 dia	
19	C-49	Chanhujo – daro	Circular Seal	1.9 dia	Perforated
20	M-417	Mohenjo – daro	Round Seal	3.4 dia	Partially broken with a perforated boss
21	Ns-3	Nausharo	Circular object	3.1 dia	
22	H-243	Harappa	Circular tablet	1.6 dia	Tablet in Bass relief
23	Nd-3	Nindowari – damb	Circular object	3.5 dia	
24	Pk-24	Pirak	Circular Seal	3.6 dia	
25	H-349	Harappa	Circular tablet with tip		1.3 dia
26	Mr-16	Mehrgarh	Circular Seal	5.1 dia	
27	C-43	Chanhujo – daro	Circular Seal	3.0 dia	Perforated
28	Pk-30	Pirak	Circular seal	2.9 dia	
29	H-362	Harappa	Prism type tablet	0.5 × 1.3	Written text on other sides
30	H-855	Harappa	Prism type tablet		0.9 × 2.3
31	M-352	Mohenjo – daro	Square seal	2.8 × 2.8	Perforated with a boss
32	Jk-3	Jhukar	Circular object	8.0 dia	Partially broken
33	Mr-1	Mehrgarh	Non standard shape	5.0 × 3.2	
	Mr-2	Mehrgarh		3.5 × 2.5	
	Mr-4	Mehrgarh		2.9 × 1.9	

34	L-99	Lothal	Rectangular seal	2.3 × 2.8	Spiked
35	Pk-45	Pirak	Circular Seal	3.4 dia	With a perforated boss
36	C-41	Chanhujo – daro	Circular Seal	2.3 dia	
37	Mr-6	Mehrgarh	Circular Seal	2.2 dia	With undivided boss
38	Mehi-1	Mehi	Circular Seal	2.0 × 2.0	
39	Pk-21	Pirak	Oval shaped seal	2.3 × 4.4	Perforated boss
40	Pk-26	Pirak	Irregular shaped seal	3.4 × 5.0	
41	Ns-1	Nausharo	Irregular shape	3.6 × 4.3	
42	M-1356	Mohenjo – daro	Rectangular	1.8 × 3	
43	M-1261	Mohenjo – daro	Square seal	2 × 2	Perforated in the middle of the short edges
44	M-1657	Mohenjo–daro	Rectangular	4.2 × 4.8	Perforated with a boss
45	Rhd-1	Rahman - dheri	Oval Shaped Bone Seal	2.7 × 3.0	Steatite ornament
46	Mr-10	Mehrgarh	Circular Seal	5.1 dia	

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