
Dice Reported from the Excavation at Vadnagar - An Urban Centre Through the Ages

Ananya Chakraborty¹ and Abhijit S. Ambekar¹

¹. Excavation Branch – V, Archaeological Survey of India, 3rd Floor, VUDA Bhawan, Near L and T Circle, Karelibaug, Vadodara, Gujarat – 390 018, India (Email: chakrabortytinni@gmail.com; abhijeetasi@gmail.com)

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Abstract: Dice are usually classified as play objects associated with the leisure element of humankind. Their antiquity however can be stretched back to the 3rd millennium BCE as evidenced from their presence in the Harappan sites, which continues through the Historical period up to the present time. In this paper, efforts have been made to typologically study the dice found from the excavations at Vadnagar (season 2016-19) on the basis of shape, materials used, marking pattern, morphometric measurements and their distribution throughout the various cultural periods at Vadnagar. Besides, the study also explores the possibility of dice games having a religio-ritual element attached to it.

Keywords: Vadnagar, Dice, Cuboid, Cubic, Religio-ritual-leisure, Denominations, Concentric Circles

Introduction

Vadnagar is an ancient historic town located in Mehsana district of North Gujarat, having a continuous human occupation since pre 2nd century BCE till present day. The present township is perched on the debris of around 20-24 m high raised archaeological mound. The town is situated around 12 kms north of Visnagar and 8 kms south of Kheralu taluka. The present township is surrounded by a fortification wall partially made of bricks and partly of stone covering an area of 1 km east-west and 700 m north-south. The historicity of Vadnagar can be traced in literature to the *Nagarakhanda* (6th part of the *Skandapurana*) which gives a vivid description of the ancient town.

The Archaeological Survey of India, Excavation Branch –V, Vadodara has taken up excavations at Vadnagar since 2014. However, in this article, the studies presented would comprise of the dice reported from three consecutive excavation seasons 2016-2019. During the season 2016-17, excavation was confined within the city walls at localities A, B, C and D, nearby the Ghaskol locality. While in the following seasons, excavations were taken up at Valmiya no Mahad and Brahman Sheri, both in the Darbargarh area (the highest part of the town), at Amba Ghat in the north-eastern

corner of the town and also along the eastern bank of the Sharmistha Lake. All the localities are shown in the map (Figure 1).

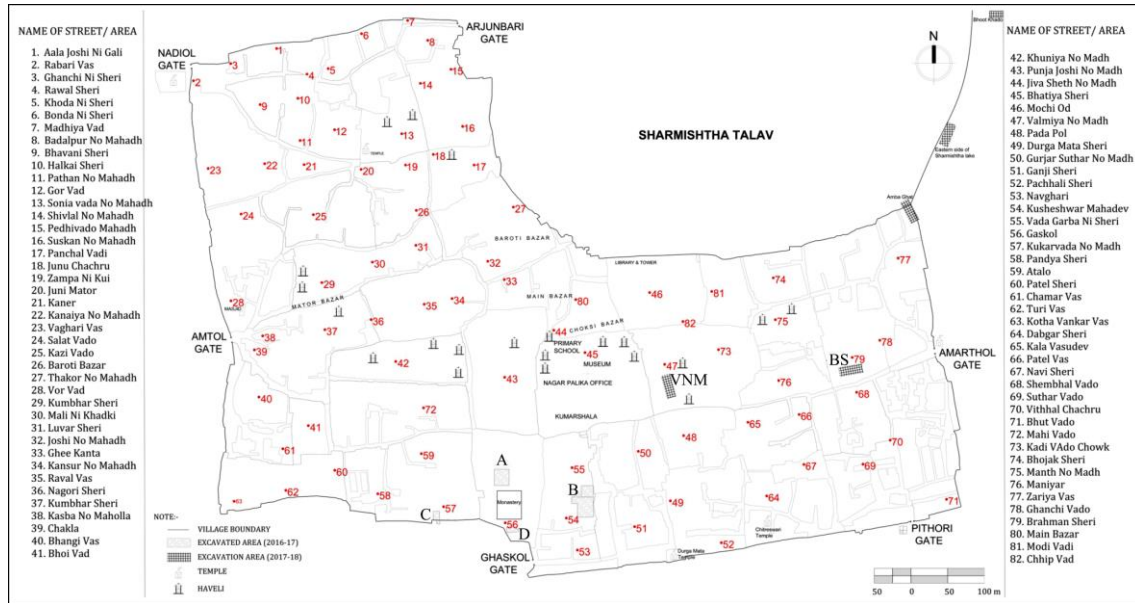


Figure 1: Localities of Excavation at Vadnagar

The excavations at Vadnagar have yielded 64 dice of different shapes, sizes and material having various markings on them. The quantitative analysis of the dice which has been formulated in this article, provide the reader with various changes documented through the periods in their shape, preferred material, marking of numerals on the dice. The cultural deposit of 24 m at Vadnagar has been classified into 7 cultural phases dated from pre – 2nd century BCE till 18th-19th century CE. This classification has been formulated on the basis of structures, ceramic assemblage and associated cultural materials unearthed from the excavation- Pd. I (pre-2nd century BCE), Pd. II (2nd century BCE – 1st century CE), Pd. III (1st- 4th century CE), Pd. IV (4th - 10th century CE), Pd. V (10th – 14th century CE), Pd. VI (14th – 17th century CE), Pd. VII (17th – 19th century CE).

Methodology

The earliest dice specimens retrieved from Vadnagar excavations belong to Pd. IV. The following methods have been adopted in order to take up this study.

- The entire collection of dice has been first classified into types based on shapes.
- The entire collection of dice has been classified based on the material used.
- The entire collection of dice has been classified based on the number of concentric circles used to denote the numerals on them.
- The dice found have been further classified based on their distribution at different localities in different periods.
- The characteristic feature of each dice has been described, along with their morphometric measurements.

The total number of dice has been classified into four major types on the basis of shape and materials (Tables 1 and 2, Figures 2 and 3).

Table 1: Shapes of Dice from Vadnagar

Dice shape	Total number
Cuboid	50
Cubic	12
Spherical	1
Trapezoidal	1

Table 2: Dice Material from Vadnagar

Dice Material	Total number
Ivory	41
Terracotta	9
Bone	7
Stone	7

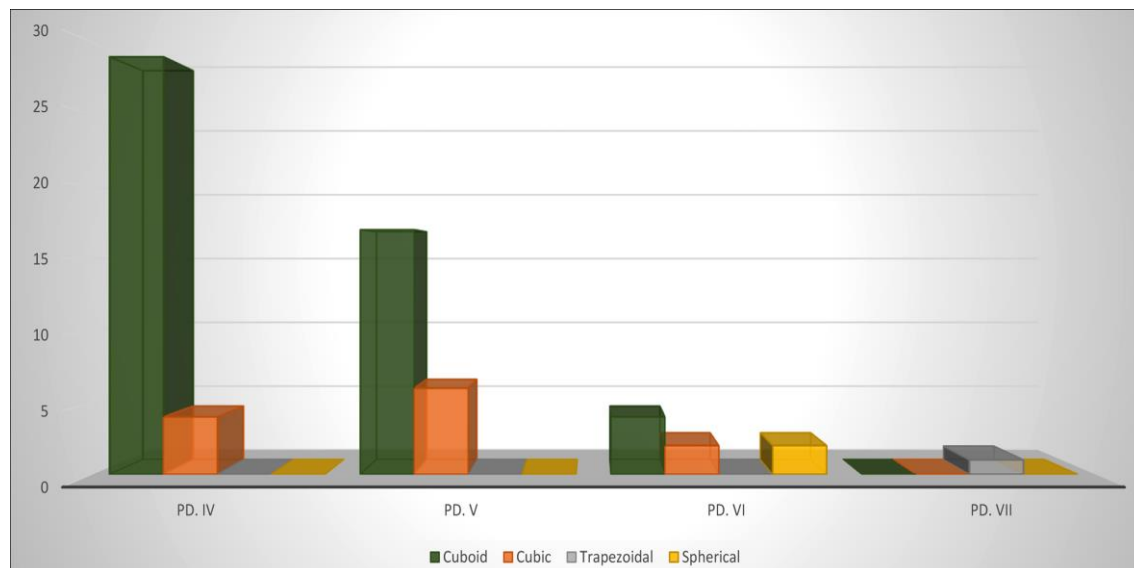


Figure 2: Shape-wise Distribution of Dice in Various Periods

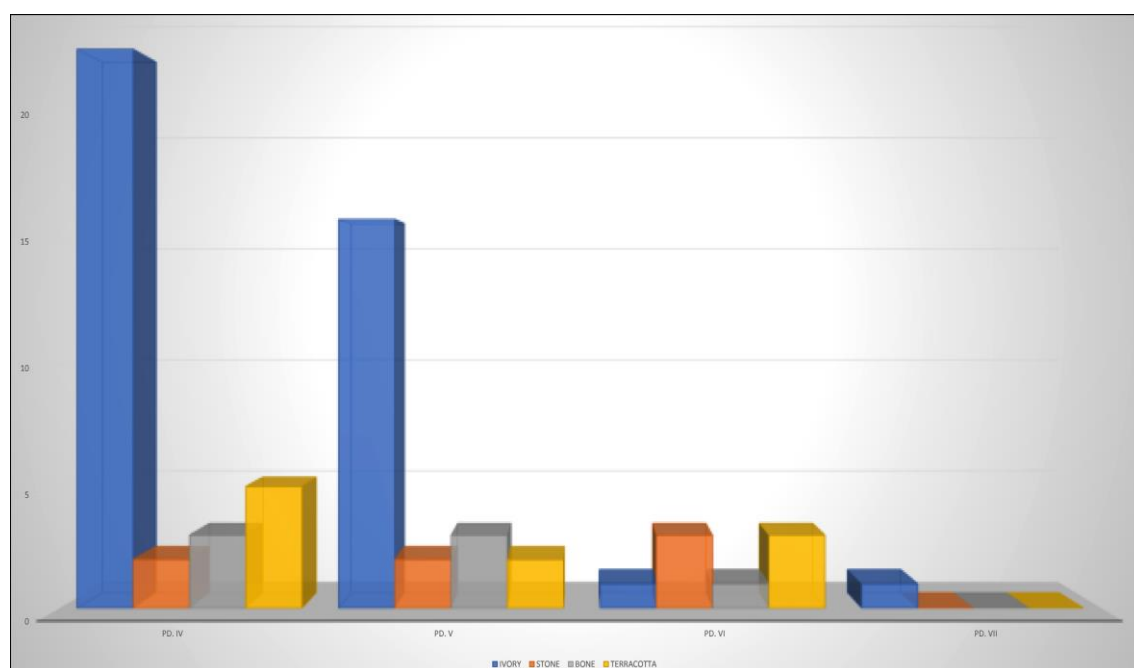


Figure 3: Material-wise Distribution of Dice in Various Periods

The definition of each shape has been given in the following paragraphs.

- **Cuboid:** A cuboid dice has six rectangular sides which is the most common shape among the dice reported from Vadnagar excavation. Out of total 64 dice, 50 are of this shape, also known as *pāsā*. This type of dice is reported right from the deposit of Pd. IV – Pd. VII, showing that the cuboid type was probably the most preferred shape throughout the periods (Figures 4 and 4a).
- **Cubic:** A cube has six uniform square-shaped sides, eight vertices and twelve edges. Four cubic dice have been reported from Pd. IV made of ivory and terracotta. Of the six cubic dice reported from Pd. V deposits, three are made of ivory and one each of bone, stone and terracotta respectively. Pd. VI also reported two cubic dice, one each of terracotta and stone (Figures 4 and 4a).
- **Spherical:** There is a single specimen of spherical dice of terracotta reported from the deposit of Pd. VI. They have numerals represented by sharp circular grooves of denominations 1 to 6 on all over it (Figures 4 and 4a).
- **Trapezoidal:** A single specimen of trapezoidal shape dice has been reported from Pd. VII deposit which is made of ivory (Figures 4 and 4a).

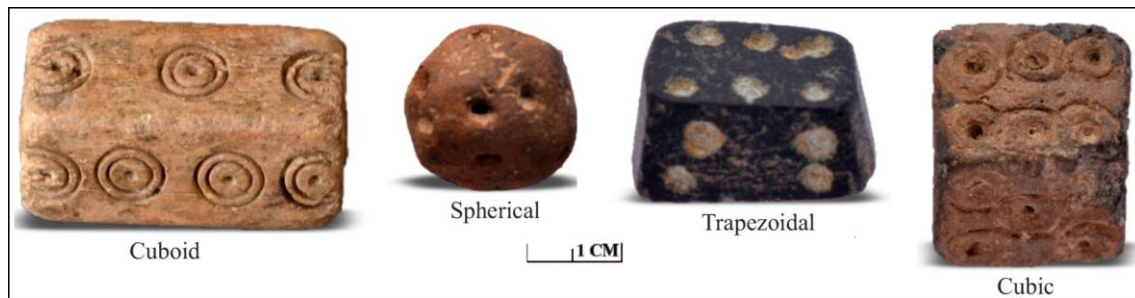


Figure 4: Shapes of Dice from Vadnagar

Table 3: Material-wise Distribution of Dice in Various Periods

Material	Pd. IV	Pd. V	Pd. VI	Pd. VII	Total
Ivory	23	16	1	1	41
Stone	2	2	3	0	7
Bone	3	3	1	0	7
Terracotta	5	2	2	0	9

Much as there are distinction in shape of dice found from Vadnagar excavation, even the material (Table 3) used to make these dice shows variation; although a distinct preference has been shown towards ivory. The details regarding the material used in making the dice (Figures 5 and 6, Table 4) are given in the following paragraphs.

- **Ivory:** A total number of 41 ivory dice are reported from Vadnagar excavation, pointing out to a distinct bias towards ivory for making dice. Out of these, 27 are highly polished and white in colour, whereas two are black in colour (probably due

to patina formation or exposure to natural elements). Among the total number of ivory dice, 34 are cuboids, 6 are cubic and 1 is trapezoidal in shape.

- **Bone:** A total of 7 bone dice are reported from the Vadnagar excavation found from Periods IV, V and VI.
- **Terracotta:** A total number of 9 terracotta dice have been reported. These types of dice appear from Pd. IV onwards. Besides dice of cuboid and cubic shapes, 1 spherical shaped dice have also been reported.
- **Stone:** A total number of 7 dice are recorded, most of which are of schist stone. This type of dice is mainly found in cubic, cuboid shapes.

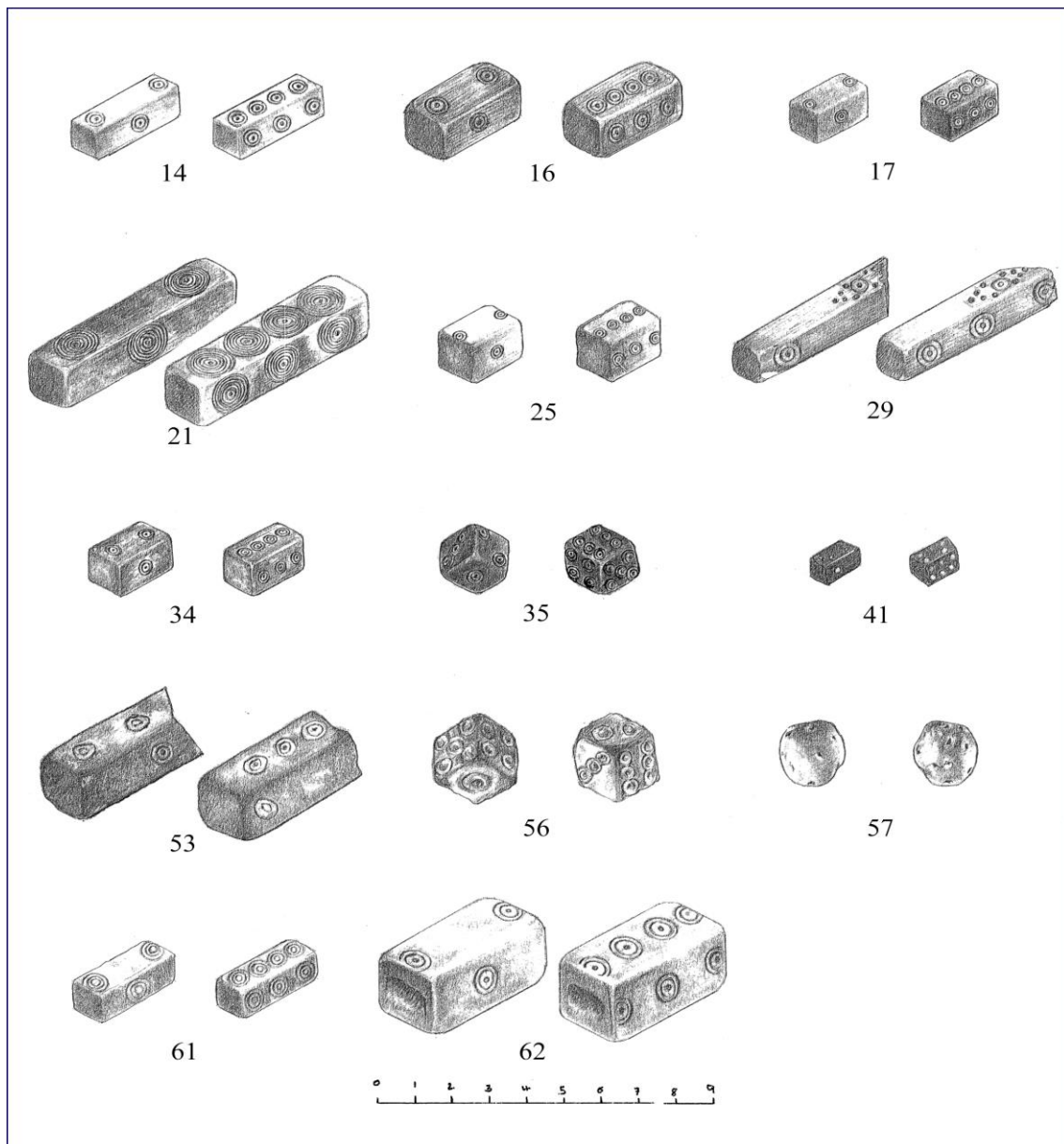


Figure 4a: Drawing showing variation in marking pattern of dice

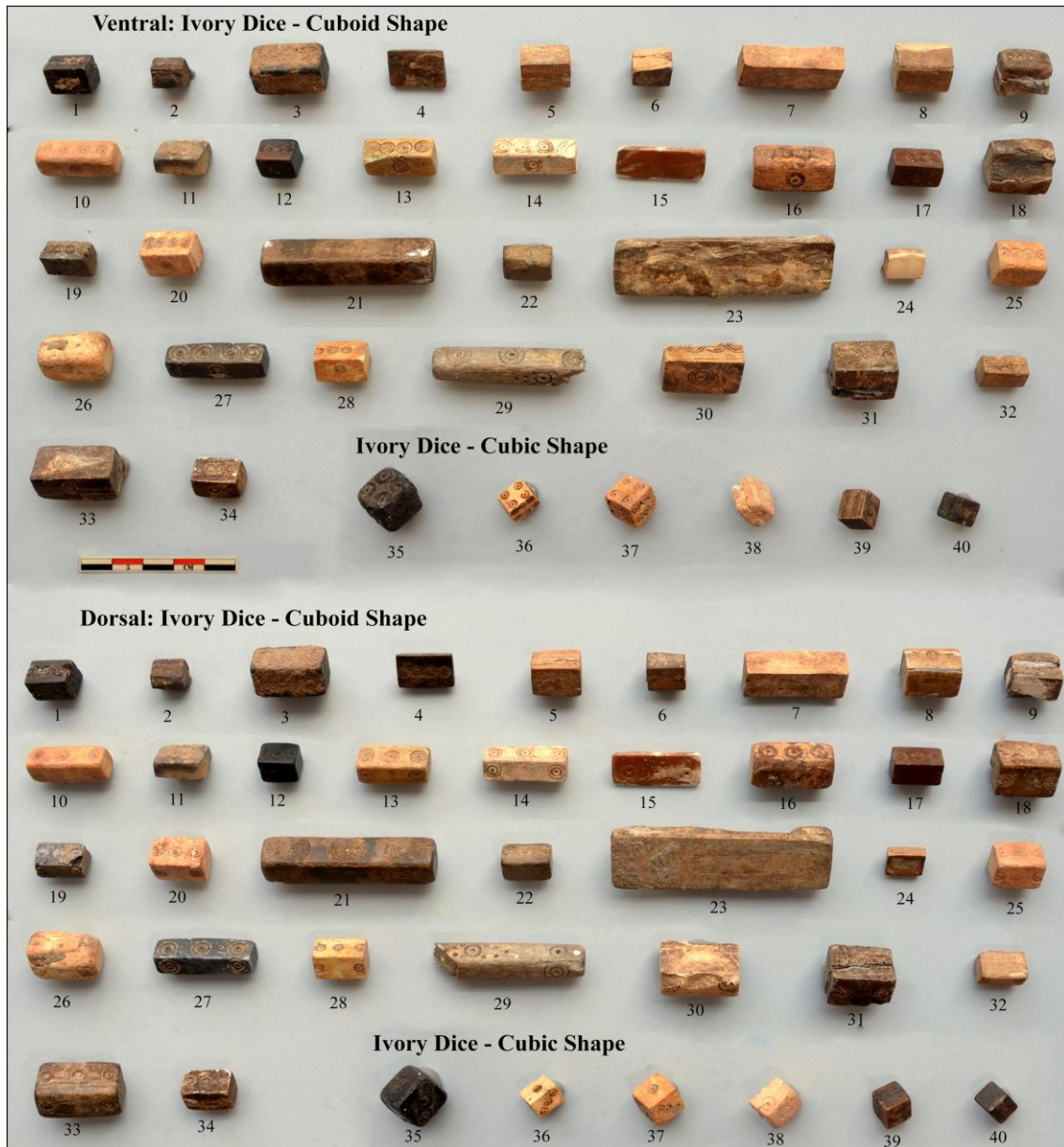


Figure 5: Dice from Vadnagar

While archaeologists usually focus on the ceramic assemblage or antiquities/ornaments found in excavation, evidence of playthings such as dice, sling-balls, hopscotch, tops in a settlement provides us with a sneak-peek into the leisure times of the people of a by-gone era. Leisure was and is quite an important aspect of societal life of human beings. Among these, dice have a religio-ritual-leisure functional element, as can be inferred from their depiction in religious sculptures. Similar parallels have been observed in present day Vadnagar during an ethno-archaeological study undertaken, where dice made of ivory, known in local Gujarati language as *shogtā* or *pāsā* are offered on silk or cloth game-boards in front of the idols of Radha-Krishna in a temple. According to the tradition which has been there for generations, it is kept throughout the year from 9 am in the morning after offering *rajabhoga* to the gods, till 4 pm in the evening, as part of a

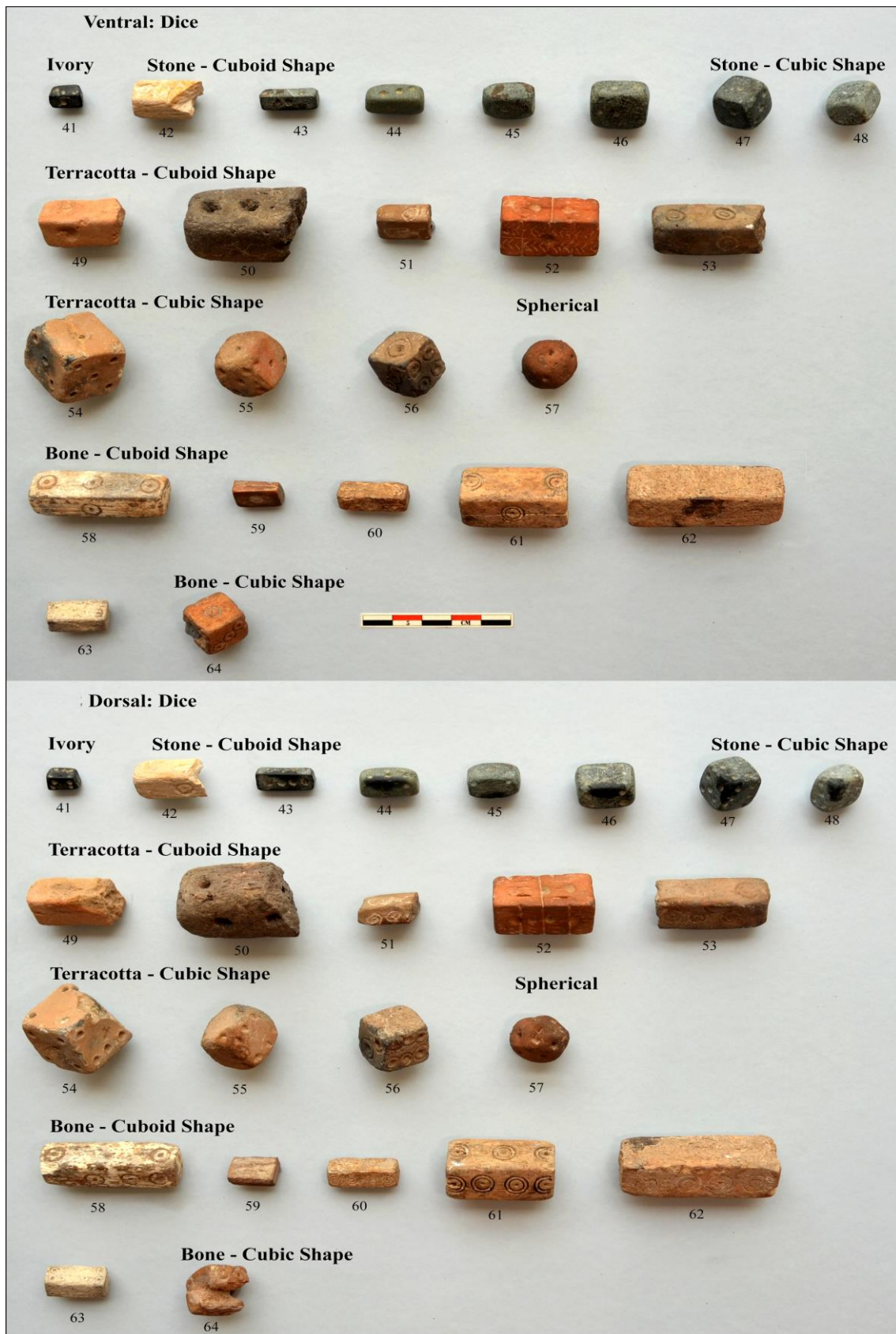


Figure 6: Dice from Vadnagar

favourite pastime of the gods. During the *sravana masa* (i.e., months of July – August), believed to be the resting period of the gods, *shogtā* is also offered between 7 pm – 8 pm in the evening for entertainment, when the idols are placed on a *jhoola* or swing within the *garbhagrihā* (sanctum). Interestingly, such tradition is not found in all the Radha-Krishna temples, but is rather peculiar to only those temples which provide *āshta-prahar sevā* (ceremonial rituals offered to the gods at 8 times during the day) to the gods and not found associated with any other gods or goddesses.

Table 4: Description of dice along with morphometric measurements

Sl. No.	Length (mm)	Breadth (mm)	Weight (gm)	Period	Description	Colour/State of condition
Ivory Dice – Shape: Cuboid						
1.	13.57	10.31	1.86	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour, with cracks visible and partially damaged.
2.	10.09	8.73	1.21	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4. Although, only the denominations 3 and 4 are visible, while 2 is partly visible.	Black in colour and broken.
3.	23.21	11.79	5.17	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour and completely encrusted with soil.
4.	17.41	12.26	0.84	IV	Double concentric circles marking	Black in colour, $\frac{3}{4}$ th of it

					four denominations on only one side.	broken.	
5.	15.15	11.09	2.23	IV	Unfinished, marking the denominations seem left to be done.	Intact, well-polished.	
6.	11.65	9.93	1.64	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4. Only the denomination of 4 is missing due to breakage, rest are all visible.	Well-polished, partly broken.	
7.	31.05	12.97	4.68	IV	Unfinished, marking is left to be done, although faint traces of attempt can be seen.	One side of it is broken. Well-polished.	
8.	16.97	11.31	2.83	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Slightly broken, with a chipped side.	
9.	15.28	10.63	2.74	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour, damaged.	
10.	24.93	9.23	3.71	IV	Double concentric	Intact, well-	

					circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	polished, having prominently marked denominations.
11.	15.99	11.13	1.42	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Damaged, only the denominations of 1 and 4 are visible, while that of 3 is partly visible.
12.	11.75	9.30	1.69	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour, smooth, polished and intact.
13.	21.77	9.18	3.11	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Slightly chipped on one corner, while the rest is intact. Well-polished, prominently marked denominations.
14.	25.14	8.28	2.28	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Intact but slight cracks visible. Well-polished, prominently marked denominations.
15.	27.33	11.89	1.72	IV	Single concentric circle, marking denomination of	Only one face of the dice found, flat in

					3, with middle circle of the denomination being surrounded by dots in a circular pattern and a parallel line of incised dots along the length of the dice is visible.	shape. White patina formation is visible around the edges.
16.	24.70	11.59	5.39	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Slightly encrustation along the circles. Shows wear and tear.
17.	15.21	8.35	2.27	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour, well-polished and intact, having prominently marked denominations.
18.	19.05	12.33	4.49	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4. Marking of denominations 2 and 3 are prominent, while that of 1 and 4 are partially visible.	Corner of one side is damaged. Shows wear and tear marks.
19.	15.50	8.71	1.67	IV	Double concentric circles marking the numerals on	Black in colour, slightly eroded, with

					four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	few cracks visible around the edges, having prominently marked denominations.
20.	16.16	10.41	2.40	IV	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Intact, well-polished having prominently marked denominations.
21.	11.75	8.98	12.05	V	Six concentric circles making the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Intact and well-polished, although it shows wear and tear marks. Patina formation visible.
22.	15.05	9.98	2.86	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Almost intact, only slightly damaged, showing patina formation, having prominently marked denominations.
23.	67.25	19.85	12.22	V	Four concentric circle marking the numerals.	Only the middle part of the dice. Traces of denomination visible, which seems to be larger than standard size.
24.	11.72	9.15	0.66	V	Double concentric circles marking	Half -broken, due to which

					the numerals of which denominations of 1, 2 and 4 are visible.	marking of denomination 3 is missing, although its traces are visible.
25.	15.20	10.81	2.95	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Well-polished, intact, having prominently marked denominations.
26.	21.30	12.53	5.19	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Intact, has soil encrustation and is slightly eroded.
27.	31.17	6.59	3.88	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour, well-polished and intact, having prominently marked denominations.
28.	15.87	9.20	2.48	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Intact, well-polished, having prominently marked denominations.
29.	47.29 (actual) 67.68 (calculated)	10.23	6.07	V	Concentric circles marking the numerals on four sides, with the denomination of 1	Half –broken.

					opposite to 3 and 2 opposite to 4. But the denominations of 1 and 3 are marked in single concentric circles, while that of 2 and 4 are in double concentric circles. An interesting phenomenon of the denominations 1 and 3 is that the middle marking is surrounded by incised dots, possibly for decoration.	
30.	24.35	16.08	5.33	V	Triple concentric circle marking numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Broken, marking of denomination 1 is visible, while that of 2 and 4 are partially visible.
31.	19.70	13.53	5.46	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour, slightly broken and eroded.
32.	14.80	9.61	1.75	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3	Half-broken, well-polished, having prominently marked denominations

					and 2 opposite to 4.	with the marking of numeral 3 is missing due to breakage.
33.	26.13	13.29	8.06	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour, well-polished, broken with the face having the denomination of 4 partly damaged. Has prominently marked denominations.
34.	15.56	9.55	1.78	VI	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Well-polished, having patina formation, showing wear and tear marks, having prominently marked denominations
Ivory Dice – Shape: Cubic						
35.	15.18	14.39	5.31	IV	Double concentric circles marking the numerals on six sides, with the denomination of 1 opposite to 6, 2 opposite to 5 and 3 opposite to 4. The denominations of 2 and 3 are marked in a diagonal fashion.	Black in colour, well-polished and intact, having prominently marked denominations. Shows wear and tear marks.
36.	10.27	8.02	0.91	IV	Single concentric circle marking the numerals on four sides, with the	Well-polished and small in size, having prominently

					denomination of 1 opposite to 6 and 3 opposite to 4. The denomination of 3 is marked in a diagonal fashion.	marked denominations.
37.	11.43	11.20	2.19	IV	Single concentric circle marking the numerals on six sides, with the denomination of 1 opposite to 6, 2 opposite to 5 and 3 opposite to 4. The denomination of 2 and 3 are marked in a diagonal fashion.	Well-polished and intact, having prominently marked denominations.
38.	12.62	12.59	1.43	V	Double concentric circles marking the numerals on the six sides, with the denomination of 1 opposite to 6, 2 opposite to 5, and 3 opposite to 4. The denomination of 2 and 3 are marked in a diagonal fashion.	Broken on one side, resulting in the denomination of 4 being missing. Rest is well-polished, having prominently marked denominations.
39.	10.44	9.20	1.88	V	Double concentric circles marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Black in colour, well-polished and intact having patina formation.
40.	10.77	8.39	1.43	V	Double concentric circles marking	Black in colour, well-polished

					the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	and intact.
Ivory Dice – Shape: Trapezoidal						
41.	10.76	5.32	0.85	VII	Circular grooves marking the numerals on four sides with the denominations of 1 opposite to 6 and 3 opposite to 4.	Black in colour and intact, having prominently marked denominations.
Stone Dice – Shape: Cuboid						
42.	21.82 (actual) 32.02 (calculated)	11.84	4.65	IV	Single concentric circles marking the numerals on four sides.	Made of sandstone. Broken in almost half, along the length.
43.	19.06	6.95	1.83	IV	Circular grooves marking the numerals on four sides, with the denomination of 1 opposite to 3 and 2 opposite to 4.	Made of schist stone. Intact and well-polished.
44.	18.96	9.11	3.75	V	Circular grooves marking the numerals on four sides, with the denomination of 1 opposite to 6 and 3 opposite to 4.	Made of schist stone. Intact and well-polished.
45.	17.17	11.11	4.22	VI	Circular grooves marking the numerals on three sides, although the markings are defaced.	Made of schist stone. Intact, yet slightly deteriorated.
46.	19.05	16.11	7.90	VI	Circular grooves	Made of schist

					marking the stone. Intact numerals on four and well-sides, with the polished. denomination of 1 opposite to 6 and 3 opposite to 4.	
Stone Dice – Shape: Cubic						
47.	14.62	14.51	6.99	V	Circular grooves marking the stone. Intact, numerals on six well-finished sides, with the and well-denomination of 1 polished. opposite to 6, 2 opposite to 5 and 3 opposite to 4. Denominations of 2 and 3 are marked in a diagonal fashion.	
48.	14.76	14.62	5.48	VI	Circular grooves marking the stone. Intact, numerals on six well-polished sides, with the denomination of 1 opposite to 6, 2 opposite to 5 and 3 opposite to 4. The markings are somewhat faded.	
Terracotta Dice – Shape: Cuboid						
49.	28.05	13.43	7.54	IV	Circular grooves marking the half-broken numeral on three along the sides. length.	
50.	33.22 (actual) 66.44 (calculated)	22.37	24.81	IV	Sharp circular grooves marking the numerals on along the four sides, which length are not clearly visible.	
51.	17.61	14.79	3.23	IV	Single concentric circles having half-broken traces of lime along the	

					marking the length. numerals on four sides, with denominations 1, 2 and 3 being visible.	
52.	31.52	15.44	12.76	IV	Depressions and lines marking the numeral on four sides. Sets of three incised chevron marks in compartments have been noticed. The elaborate details of this unique dice has been discussed later.	Red in colour, intact, well-preserved.
53.	35.08 (actual) 48.20 (calculated)	14.64	12.24	V	Double concentric circles marking the numerals on four sides, with the denominations of 1, 2 and 3 being clearly visible.	Black/grey in colour, half-broken along the length, having prominently marked denominations.
Terracotta Dice – Shape Cubic						
54.	23.58	22.35	18.25	IV	Sharp circular grooves marking the numerals on six sides, with the denomination of 1 opposite to 6, 2 opposite to 5 and 3 opposite to 4. The denominations of 2 and 3 are marked in a diagonal fashion.	Red in colour, one side corner of it is broken.
55.	19.94	18.31	10.41	V	Shallow circular grooves marking	Red in colour, intact, well-

					the numerals on six sides, with the denomination of 1 opposite to 6, 2 opposite to 5 and 3 opposite to 4. The denominations of 2 and 3 are marked in a diagonal fashion.	preserved with rounded edges.
56.	17.40	16.80	8.29	VI	Single concentric circle marking the numerals on six sides, with the denomination of 1 opposite to 6, 2 opposite to 5 and 3 opposite to 4. The denominations of 2 and 3 are marked in a diagonal fashion.	Red in colour, having black burning patch. Has sharp edges and prominently marked denominations.
Terracotta Dice – Shape: Spherical						
57.	16.92	15.45	4.76	VI	Sharp circular grooves marking the numerals on all the sides. The denominations of 1 to 6 are visible.	Red in colour, having no surface treatments and is eroded.
Bone Dice – Shape: Cuboid						
58.	45.18	13.48	10.95	IV	Single concentric circles marking the numerals on four sides, with denominations of 1 opposite to 2 and 3 opposite to 4.	Slightly broken, formation of patina of white colour is seen, having prominently marked denominations with encrustations.

59.	15.36	10.53	1.75	IV	Double concentric circles marking the numerals on four sides, with denominations of 1 opposite to 3 and 2 opposite to 4.	Broken in half, with prominently marked denominations.
60.	23.19	8.10	2.53	IV	Triple concentric circles marking the numerals on four sides, with denominations of 1 opposite to 3 and 2 opposite to 4.	Intact, markings somewhat faded, showing wear and tear marks.
61.	34.41	17.39	13.36	V	Double concentric circles marking the numerals on four sides, with the denominations of 1 opposite to 3 and 2 opposite to 4.	Slightly damaged in core, having cracks, well-polished and prominently marked denominations.
62.	50.62	17.61	15.44	V	Double concentric circles marking the numerals on four sides, with denominations of 1 opposite to 3 and 2 opposite to 4.	Only the denominations of 1 and 4 are visible, rest are encrusted by soil.
63.	19.93	9.14	2.12	VI	Single concentric circles marking the numerals, although they are not visible. Only faint traces showing denominations of 6 and 8 are visible.	Poorly visible due to presence of soil encrustation.

Bone Dice – Shape: Cubic						
64.	15.89	15.68	4.57	V	Single concentric circles marking the numerals on six sides, with the denomination of 1 opposite to 6. Only the denominations of 1 and 3 are intact, rest are broken. The denomination of 3 is marked in a diagonal fashion.	Partially broken corner, well-polished having prominently marked denominations.

Discussion

Among the total number of 64 dice described above, differences in the depiction of denominations have been observed. These include single concentric circle, double concentric circles, triple concentric circles, four concentric circles and six concentric circles. The depicted numerals in dice too vary according to shape. While the denominations 2 and 3 in cubic shaped dice are mostly depicted in a diagonal fashion, the numerals in cuboid shaped dice are depicted in a linear fashion. The examples of such variation may be found in the description given of dice having Sl. nos. 15 and 29, which stand out due to their dotted decoration. The former was found from Locality A made of ivory, while the latter was found from Valmiya no Mahad. Each and every dice has been individually weighed to find out whether there was any standardisation followed. But given the variations found in their measurements, it can be inferred there is no standardisation present. While as far as cubic shaped dice are concerned, two varieties of marking denomination can be observed – one where the markings are on all six sides, the other where the markings are only on four sides. One might argue that the latter could be unfinished, although no attempt for making incision has been found. The markings on dice are quite sharp and precise in nature, revealing the skill of the craftsman and also the usage of a pointed metal tool for achieving precision (Figures 7 and 8, Table 5).

Interestingly, a noteworthy terracotta dice reported from Pd. IV mentioned at Sl. no. 52 is being elaborated here (Figure 9). This terracotta cuboid dice is marked with denominations 1 opposite to 3 and 2 opposite to 4. Each side of the dice is compartmentalised, with each compartment incised with a design of a set of three lines. The side of the dice with numeral 1 has eight compartments, each having incisions of a set of three chevron marks. The opposite side of numeral 3 is marked with two segments having a set of three parallel lines in both the segments. The side with the numeral 2 is compartmentalised into four divisions with each division incised

with a set of three parallel lines. The side with the numeral 4 has eight compartments with each having a set of three parallel lines. This dice has close resemblance with the terracotta tablets having similar incised set of three lines. This particular terracotta dice becomes more significant as it is reported from the deposit of an impressive structure of religious nature.

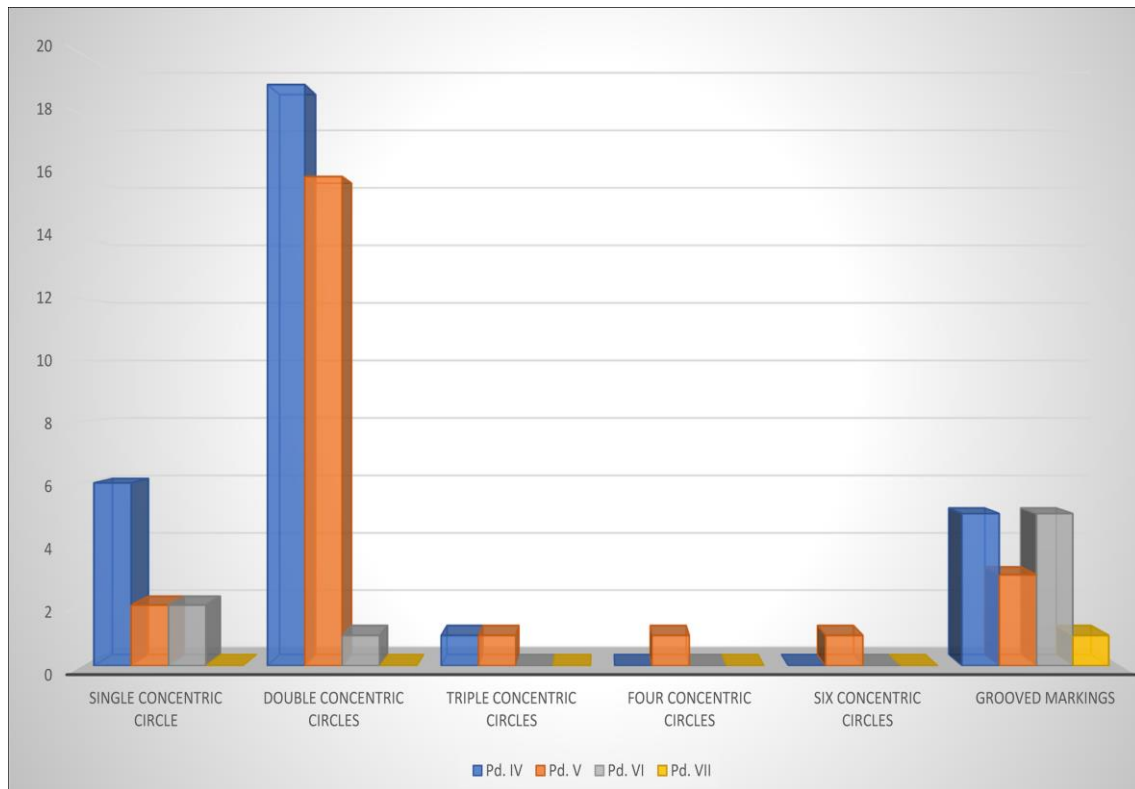


Figure 7: Distribution of Marking Pattern on Dice

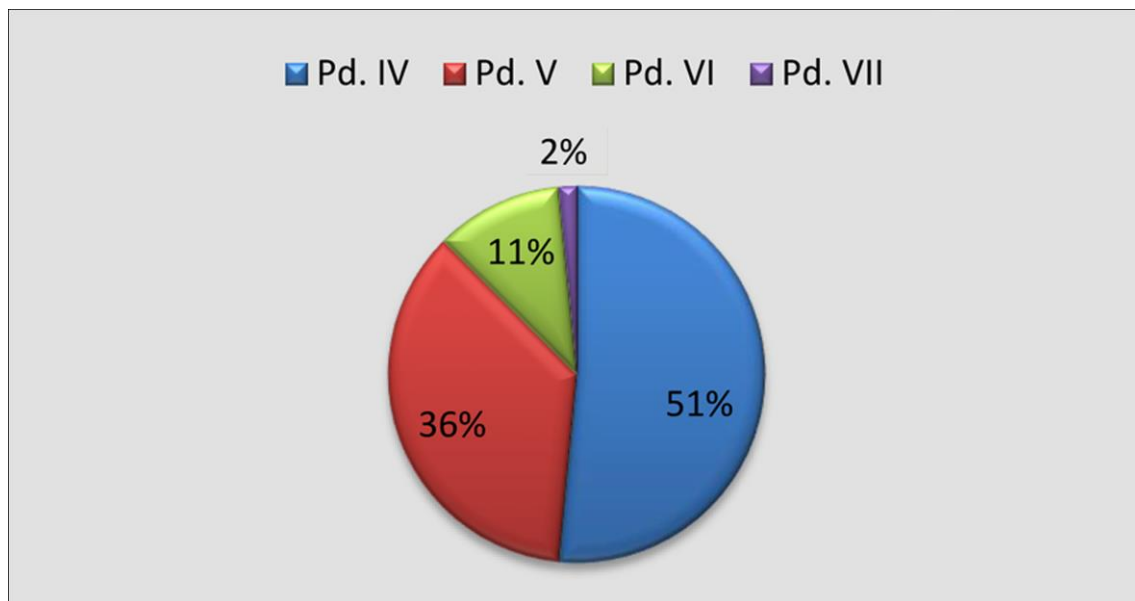


Figure 8: Percentage of Dice found through the Periods

Table 5: Marking patterns observed among dice from Vadnagar

Types of Marking Pattern on Dice	Period IV	Period V	Period VI	Period VII	Total*
Single concentric circle	6	2	2	-	10
Double concentric circles	19	16	1	-	36
Triple concentric circles	1	1	0	-	2
Four concentric circles	0	1	0	-	1
Six concentric circles	0	1	0	-	1
Grooved markings	5	3	5	-	14

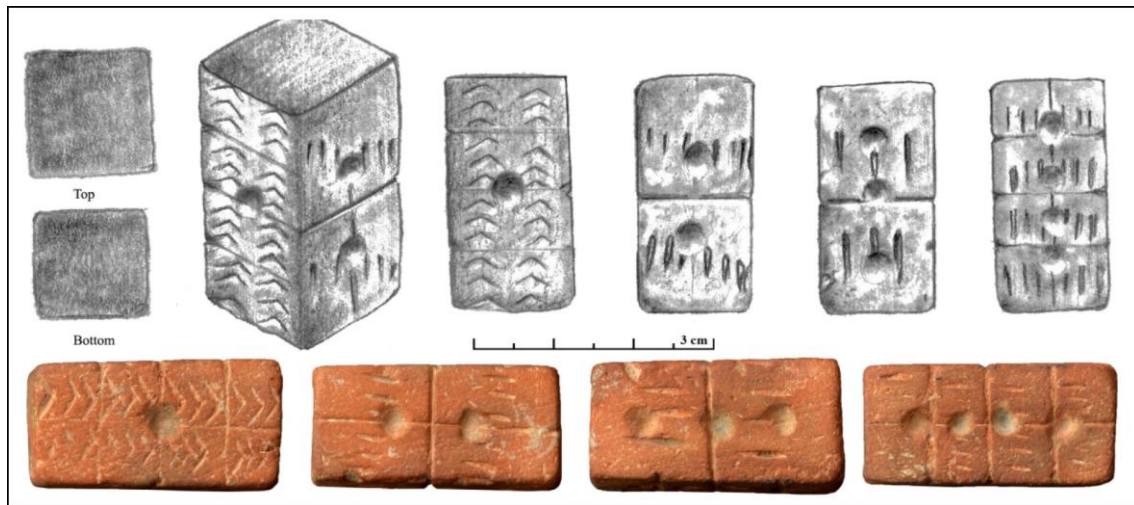


Figure 9: Terracotta Cuboid Dice Sl. No. 52

The dice reported are further classified based on period, which goes on to show that maximum number of dice have been found from Pd. IV, which steadily declines by the time of Pd. VII. Evidence of dice and stone game-boards have also been unearthed from the Harappan site of Dholavira, in Gujarat, tracing the antiquity back to mid 3rd millennium BCE. Other Harappan sites such as Alamgirpur, Desalpar, Kalibangan, Lothal and Ropar have also reported dice made of bone and ivory. During the early centuries of Common Era, dice were found to have been made of stone, shell and terracotta too (Ghosh, 1989). Excavation at Nagara had also reported three specimens of dice (Mehta 1968).

A model game-board made on potsherds and brick have been identified at Lothal and in Early-Historic period, such game-board incised on a stone slab has also been reported from Nagarjunakonda. Interestingly, a game-board on brick had been found during the exploration undertaken at Girnar (Junagadh, Gujarat) in 2001 by the Archaeological Survey of India. Around 25 sites belonging to Early – Historic period had been reported, among which from one site named Lakha-Phulani ki Medi, a broken game-board on brick measuring 24x24x7 cm had been found, having incised decorations of six rows and six squares in each row (Figure 10).



Figure 10: Brick Gameboard from Lakha Phulani ki Medi, Girnar

As an indoor or outdoor game, dice and/or board-games enjoy quite popularity among individuals of most age – groups in present day society. In ancient sculptures too, references have been found of dice-games between Siva and Parvati in which Parvati wins. There is evidence of two sculptures, one displayed in Birla Museum Bhopal and the other one in Kakpur, Vidisha District, Madhya Pradesh, beautifully depicting Siva and Parvati engrossed in a board-game. These sculptures belonging to 10th century CE have carved out game-board and gamesmen in it (Joshi, 1979). It is also evident from the game-boards found etched on the floors, walls of ancient caves in Bhaja, Ajanta, Ellora, that dice or game-boards were probably a much favourite pastime among monks as well.

Conclusion

In order to explain the past human behavioural pattern and cultural process producing such archaeological records, one need to understand the processes of layer formation through continuous occupation. Therefore, the absence of dice belonging to Pds. I, II and III of Vadnagar may be attributed to the constraint of space in cutting of particular horizons. It has been observed that among the cuboid shaped dice, generally the marking of numerals comprises of the denomination of 1 opposite to 3 and that of denomination 2 opposite to 4. While in cubic shaped dice, the marking of numerals show the denominations of 1 opposite to 6, 2 opposite to 5 and 3 opposite to 4, which have been arranged such that each of the sums of denominations opposite to each other is seven.

Moreover, the dice found from Vadnagar excavation show very little wear and tear in them, the possible explanations for which could either be the fact that they were mostly used in religious offering to gods or could be the fact that they were probably played upon soft surfaces such as cloth, silk or sand. The finding of varieties in shape, size, marking of numerals among them have provided us with quite an array of information about the still-popular game.

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